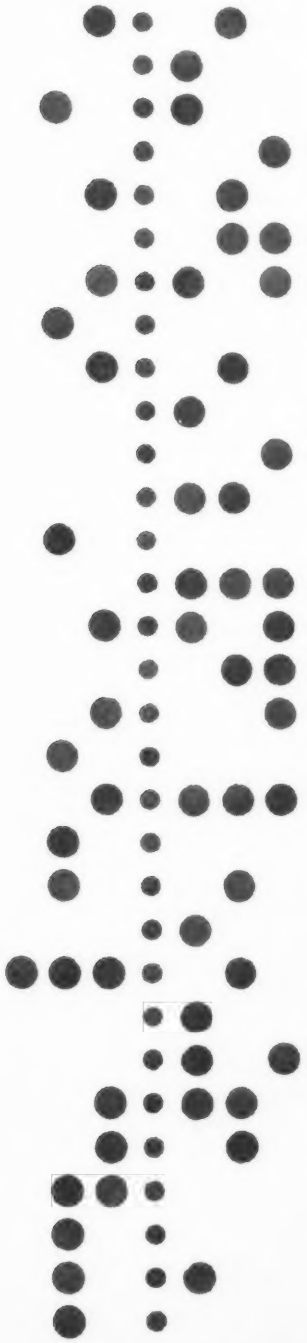
October 20, 1965

U.S. GOVERNMENT

RESEARCH & DEVELOPMENT REPORTS



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U. S. DEPARTMENT OF COMMERCE / NATIONAL BUREAU OF STANDARDS / INSTITUTE FOR APPLIED TECHNOLOGY

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RESEARCH AND DEVELOPMENT REPORTS

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PURPOSE

U.S. GOVERNMENT RESEARCH AND DEVELOPMENT REPORTS is published by the Clearinghouse for Federal Scientific and Technical Information to announce the availability of new reports of U.S. Government-sponsored R&D released by the Department of Defense and other Federal agencies. Included are reports from the Atomic Energy Commission and the National Aeronautics and Space Administration, which issue separate announcement journals as noted below.

FORMAT

USGRDR contains two sections with a combined table of contents. The first section, "Technical Abstract Bulletin" (TAB), announces reports released by the Defense Documentation Center (DDC) of the Department of Defense. The second section, "Other Research Reports and Related Material," announces reports released by civilian agencies and also includes certain older military reports. Reports are listed by accession/report number under 22 major subject category headings. Both sections contain abstracts and complete bibliographic citations and are followed by their respective indexes. Reports of current high industrial interest are featured in "Research Highlights."

HOW TO USE

Readers are urged to review all abstracts in their fields of interest, noting accession/report numbers and titles of reports to be ordered. Although primarily for retrieval, the descriptors provide a quick grasp of a report's scope. The reader is reminded that reports applicable to his field may be found under various subject category headings; the various indexes will aid in locating those reports. A single reference guide to new Government-sponsored technical literature, *Government-Wide Index to Federal Research and Development Reports*, is compiled monthly by the Clearinghouse from the combined indexes of this journal, *Nuclear Science Abstracts* (AEC), *Scientific and Technical Aerospace Reports* (NASA), and *Technical Abstract Bulletin* (DDC). This combined index is available from Superintendent of Documents, U.S. Government Printing Office, annual subscription $16, ($4.00 for foreign mailing) or $1.75 single copy.

TO ORDER REPORTS

All reports announced herein are available to the general public from the Clearinghouse, or in some cases from other sources as noted. To order Clearinghouse reports, use accession/report number (as given on the first line of each entry) and title from the Clearinghouse, U.S. Department of Commerce, Springfield, Va. 22151, or from any Commerce Field Office (listed on inside back cover). Prices for hard copy (HC) and microfiche copy (MF) are given for each entry. Prepayment is required unless purchases are to be charged to Clearinghouse deposit accounts. Order forms will be found in the back. Make check or money order payable to National Bureau of Standards—CFSTI.

OTHER JOURNALS

Reports of the National Aeronautics and Space Administration and the Atomic Energy Commission can be ordered from the Clearinghouse. They are abstracted in the following journals available from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

NUCLEAR SCIENCE ABSTRACTS, Atomic Energy Commission, $30 a year domestic, $37 foreign, $1.75 single copy plus 25 percent foreign mailing.

SCIENTIFIC AND TECHNICAL AEROSPACE REPORTS. National Aeronautics and Space Administration, $33.00 a year domestic, $42.00 foreign, $2.50 single copy plus 25 cents foreign mailing.

U.S. DEPARTMENT OF COMMERCE
John T. Connor, Secretary

CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION
Springfield, Va. 22151
Bernard M. Fry, Director

Contents may be printed freely. Mention of source will be appreciated. Use of funds for this publication approved by the Director of the Bureau of Budget, June 30, 1961.

special ANNOUNCEMENTS

USGRDR GOES TO AUTOMATIC PHOTOCOMPOSITION

Another phase of our continuing program to improve the appearance and utility of the USGRDR is now underway. The white section (Technical Abstract Bulletin) is now prepared on computer-actuated photocomposition equipment. The blue section (Other Research Reports and Related Material) will be included shortly in this new system of photocomposition to produce a journal of uniform printing format.

Automatic photocomposition of the USGRDR starts with the document records (indexing data and abstracts) prepared on punched paper tape at the Clearinghouse. This tape is then put through a series of computer conversion processes for insertion into automatic photocomposition equipment at the U. S. Government Printing Office. From the final computer input the photocomposition equipment produces page length columns with justified margins. These columns are then assembled into complete journal pages for photo offset printing.

As in all projects involving new equipment and procedures it is inevitable that some errors will occur. These will be eliminated in future issues.

The indexes to both sections of the journal will continue to be processed in the conventional manner without automatic photocomposition.

PINPOINTING R&D REPORTS

Selection Aids For Industry

- GOVERNMENT-WIDE INDEX appearing monthly is a single reference guide to Government-sponsored research and development announced in four of the major technical announcement journals of the Federal agencies: USGRDR, Technical Abstract Bulletin of the Defense Documentation Center, Nuclear Science Abstracts of the Atomic Energy Commission, and Scientific and Technical Aerospace Reports of the National Aeronautics and Space Administration. (Annual Subscription $16.00, $4.00 additional for foreign mailing, $1.75 single copy.) Available from Superintendent of Documents, U.S. Government Printing Office, Washington, D. C., 20402.

- SELECTIVE BIBLIOGRAPHIES--from Abrasives to Zirconium--will be mailed free. A list of more than 200 available from the Clearinghouse will be mailed on request.

- LITERATURE SEARCHING SERVICE provides two kinds of bibliographies:
  a) Current Awareness on selected fields of interest on a periodic basis.
  b) Retrospective, listing the literature available to date.
  Made to order using the combined facilities of the Clearinghouse, the Science and Technology Division of the Library of Congress and the science collections of the Departments of the Interior and Agriculture, or any combination of these facilities at $11 an hour (8 hours minimum searching time).

- FAST ANNOUNCEMENT SERVICE reviews reports of special industrial significance. Announcements are selected and mailed by industrial category. No charge.

- RESEARCH REVIEWS, compiled by the National Bureau of Standards, are summaries and bibliographies of R/D reports which for the most part are in the Clearinghouse collection. Available at no charge from the Clearinghouse are the following:

OTR–101	Hot Machining	OTR–114	Ultrasonic Testing
OTR–102	Nickel-Titanium Alloys	OTR–115	High Energy Metal Forming
OTR–103	Photochromism and Phototropism	OTR–116	Numerical Controls
OTR–104	Fire-Extinguishing Material Technology	OTR–117	Dielectric Films in Microelectronics
OTR–105	Flame-Retardant Textiles	OTR–118	Fiber Optics
OTR–106	Humidity-Controlled Warehousing	OTR–119	Honeycomb and Sandwich Materials
OTR–107	Concrete Technology	OTR–120	Microminiature Circuit Packaging Techniques
OTR–108	Volatile Corrosion Inhibitors	OTR–121	Foam Technology and Application
OTR–109	Grease Lubrication	OTR–122	Dispersion-Hardened Metals & Alloys
OTR–110	Thermoelectric Materials & Fabrication	OTR–123	Solid Film Lubrication
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Reports of current high industrial interest

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Acoustics

THE NOISY WORLD OF THE SEA

(Order AD-619 283 Review of Marine Bio-Acoustics, HC $4.00/MF 75 cents.)

The sea around us is far from silent; it's noisier than the average environment on land. Scientists at the American Museum of Natural History who studied the sounds for the Navy say the average level of sea noise is about 10 to 15 decibels above 1 microbar, which is roughly comparable to a busy office with typewriters clattering, papers shuffling, people walking and talking, and telephones ringing. The usual situation encountered is one in which there is noise produced by wave motion on the surface, by the friction of moving water currents against the sea bottom and against each other, by shipping traffic, and, superimposed on all these, by marine animals. Added to all this is the fact that sound travels almost five times faster in the sea than it does in air--4920 feet per second, as compared with 1080 feet per second in air. Marine animal noises are often in frequency ranges that can interfere with sonar gear, acoustic mines, and underwater listening equipment. It all adds up to a serious problem for scientists and engineers who have to detect and analyze underwater sounds, and the sonarman who must identify unknown sound sources. The oscilloscope and various meters and filters can be used to analyze these complex sounds, but researchers at the American Museum of Natural History say the most useful device is the sound spectrograph. This machine can produce a graphic record of a sound so that all its qualities can be seen and measured. Thus most sea sounds can be pictorially represented and their component parts analyzed and measured.

Control Systems and Instrumentation

A DOUBLE LEG ELBOW AMPLIFIER

(Order AD-618 103 Research Studies in Proportional Fluid State Control Components (Part 2), HC $3.00/MF 75 cents; Part 1 of an earlier DLEA study, same title, AD-421 923, is also available, HC only, $8.10.)

Researchers of Giannini Controls Corporation have optimized a double leg elbow amplifier (DLEA) to the extent that it will be excellent in control applications demanding high mass flow gains and high power gains, especially in the control of gases at extremely high temperatures. The researchers ran one DLEA in a closed condition and also coupled two DLEAs and tested them in a staged package. They conclude that with two stages of amplification, differential mass flow gains in the 5,000 to 10,000 range can easily be obtained. The staged package had good dynamic response up to at least 5 cps. Tests conducted with hot gas as a working medium show that the DLEA can function with hot gas as a driver. Results of the entire study indicate that DLEA elements are excellent for a fluid control system in which high mass flow gains and high power gains are required.

Electronics

MEASUREMENT OF NOISE IN NONDESTRUCTIVE SCREENING

(Order AD-618 469 Nondestructive Reliability Screening of Electronic Parts Using RF Noise Measurements, HC $5.00/MF $1.00.)

Radio frequency noise measurement is a valid technique for the nondestructive reliability screening of electronic parts. Honeywell's Aeronautical Division recently made tests for the Air Force substantiating their earlier conclusion that there is a higher incidence of failure of electronic components containing high RF noise over those that do not exhibit such noise. The RF noise measurements were made on silicon diodes and solid tantalum capacitors. The ratio of failure for diodes was two to one, for capacitors three to one. Even more significant was the greater difference in failure during the initial 250 hours of testing: noisy diodes failed 2.6 times over quiet ones, noisy capacitors 6.2 times. These tests indicate that the RF noise generated by individual diodes and capacitors in a production lot can be used to identify mechanically faulty units which are undetected by conventional test methods. Gross defects such as poor bonds, large fractures, and voids were discovered in noisy diodes while quiet ones showed none. As a result of the selection and rejection of high RF noise devices from the production lot, the overall lot failure rate was significantly reduced.

Since this technique detects failure modes which are likely to occur in all electronic parts, Honeywell suggests it appears feasible to include the technique in the specifications for all parts. Before inclusion as a spec requirement, however, its effectiveness should be determined on part types other than those included in the present study. Overall cost per part is also a factor.

The specific intent of this nondestructive screening technique was to establish and validate RF noise measurements as a method for selecting and rejecting from a production lot of electronic parts those parts with lifetimes less than the average lifetime of the production lot, thereby increasing average lifetime and time to first failure. As used in this study, the term RF noise denotes the generation of broad-band noise by electrical impulse signals or breakdown phenomena at frequencies between 2 MC and 30 MC. In particular, the term noisy denotes the presence of excessive or an abnormal amplitude of broad-band noise at these frequencies. All operating electrical circuits exhibit normal thermal and conductive noise levels which establish a background noise level or signature for each particular part or circuit. The generation of transient impulse signals caused by short duration faults within a part raises this background noise level. Such parts can be segregated from a population of parts by monitoring the overall noise level with a radio receiver.

TWO-VOLUME GUIDE TO INTERFERENCE REDUCTION

(Order AD-619 666, Vol. 1, and AD-619 667, Vol. 2, Interference Reduction Guide HC Vol. 1, $7.00/MF $1.75; HC Vol. 2, $7.50/MF $2.00.)

A very broad two-volume guide to interference reduction has been prepared by the Army Electronic Laboratories. The work provides the engineer with the necessary background and techniques to enable him to minimize the interference generation and susceptibility of communication-electronic equipment he designs. It is intended for design engineers with little or no interference reduction experience. The various types of interference are defined and illustrated with text, their generation in equipment is discussed, and interference transfer media are also looked into. Electromagnetic compatibility control and test plans, and grounding, bonding, and shielding design theory and practice are also extensively reviewed. The engineers who prepared the work note that there are two approaches to interference reduction: initial design for optimum reduction and application of remedial control measures after equipment has become operational. Of these approaches, the authors prefer the former. The initial design approach entails early determination of interference generation and susceptibility characteristics of a particular piece of equipment in its operational environment, based upon equipment function, configuration, and performance, and upon interference specifications. The equipment is then designed to meet both performance and interference requirements.

Engineering and Construction

BREAKING ROCK WITH NUCLEAR EXPLOSIVES

(Order UCRL-12180 Rev. 2 Aggregate Production with Nuclear Explosives, HC $2.00/MF 50 cents.)

Lawrence Radiation Laboratory reports that breaking rock with nuclear explosives for use as rough aggregate is now technically feasible. This capability has been demonstrated by underground experiments in hard rock. Limitations arising from safety

considerations are not excessive and will permit the use of nuclear explosives at many sites. The greatest spur to the introduction of such explosives as a tool for breaking rock in the multibillion-dollar aggregate-using industries will be the great potential for inexpensively increasing the availability of high-quality crushed-stone aggregate. Under favorable circumstances, the total per unit cost of crushed stone from the nuclear quarry after sizing and all necessary processing can be lower than the cost of a similar product produced by conventional methods.

Food Processing

THERMAL RESISTANCE OF CLOSTRIDIUM BOTULINUM TYPES A, B, AND E

(Order COO-1095-3 A Study of the Effect of Ionizing Radiation on Resistance, Germination, and Toxin Synthesis of Clostridium Botulinum Spores, Types A, B, and E, HC $4.00/MF 75 cents.)

A recent study of human botulism and its killing effects emphasizes Type E, the Clostridium organism found to be responsible for the September 1963 outbreak transmitted by fishery products. University of Michigan biochemists studied the thermal resistance of spores of 11 strains of C. botulinum Type E in phosphate buffer at pH 7.0 in the temperature range of 60 to 90°C. According to the AEC-sponsored researchers, all strains had a similar resistance to heat. Very little inactivation occurred at 60 and 65°C, but at 70 to 90°C there is a rapid initial kill of the majority of the spores in the population within 10 minutes of heating, with a small fraction surviving longer heating times giving a tailing effect. With two strains slight activation of dormant spores was apparent at 70°C. Toxin production was detected by the spores surviving heating at higher temperatures and for longer periods of time. In some cases, however, nontoxic isolates were obtained. Spores produced by the heat-surviving spores had a resistance similar to the stock spore suspensions. Resistance of the spores of six strains of Type E to gamma radiation (cobalt-60) in phosphate buffer was found to be similar, but less than Type A spores. Irradiation of the spores in haddock homegenates and oyster juice resulted in an increase in survivors which was 100-1000 fold greater than that resulting from irradiation in phosphate buffer.

Low-Temperature Materials and Processes

CRYOGENICS MATERIALS DATA HANDBOOK REVISED AND UPDATED

(Order AD-609 562 Cryogenics Materials Data Handbook, Second Revision, HC $7.00/MF $3.50; AD-611 165 Cryogenics Materials Data Handbook, Supplement 1, HC $6.00/MF $1.50; AD-618 065 Cryogenics Materials Data Handbook, Supplement 2, HC $6.00/MF $1.50.)

A completely revised Cryogenics Materials Data Handbook, Second Revision of August 1964, and updated supplements to July 1965 have been compiled, obsoleting all

previous reports. Prepared for the Air Force by Martin Marietta, the new Handbook and its supplements contain mechanical and physical property data on 78 metallic and nonmetallic materials to cryogenic temperatures below -400°F. The materials include aluminum alloys, stainless steels, titanium alloys, superalloys, alloy steels, miscellaneous metals and alloys (such as beryllium copper and Invar), polymerics, and fiber-reinforced plastics. The data contained in the Handbook represent typical properties, not design data. The authors have attempted to screen all material, however, to include only reliable data in their revision. In some cases, data formerly in the Handbook have been deleted; other data are now being further examined before being included in supplement reports which will be issued semiannually. The Clearinghouse maintains a mailing list for those who want to be advised of the availability and prices of the Cryogenics Handbook revisions. Write CFSTI and your name will be added.

Metalworking and Metal Forming

FRACTURE-SAFE DESIGN OF COMPLEX WELDED STRUCTURES

(Order AD-619 574 Review of Concepts and Status of Procedures for Fracture-Safe Design of Complex Welded Structures Involving Metals of Low to Ultra-High Strength Levels, HC $3.00/MF 75 cents.)

Fracture-safe design is a problem that demands a variety of approaches and there is no one method panacea, according to the Naval Research Laboratory. The NRL calls on metallurgists to recognize "a simple, yet fundamental fact that structural design problems cover a wide spectrum." NRL splits this spectrum broadly into terms of two generic classes of structures requiring fracture-safe design consideration: (1) those that are rigorously stress analyzable at all locations; and (2) those that are stress analyzable in the usual rough sense, particularly only in regions of relative geometric simplicity.

NRL's work is specifically aimed at giving integrated analyses and substantiating data on problems associated with fracture-safe design and fabrication of large welded structures using high strength metals. It indicates that the metallurgical problems of optimizing the base metals, welds, and heat-affected zones have been complicated by the absence of parametric frames of reference needed as bases of comparison. The absence of such broad-base guide lines, says NRL, arises from the failure to evolve an adequate understanding of the significance of conventional engineering tests and from the previous absence of definitive tests that provide assessment of failure mode sensitivities across the full spectrum of materials and attainable strength levels.

The development of such test procedures is one of the principal aims of the NRL study. The spectrum view that has emerged clearly defines metals and specific strength ranges that provide for matching to applications involving conventional fabrication of complex structures, as compared to those that require exact design and fabrication. Thus, applications that may provide fracture-safe design based on the use of simple engineering test methods may be separated from applications that require the exact mathematical analyses of fracture mechanics.

Power Source Devices

ELECTRICITY PRODUCED FROM COCONUT JUICE

(Order AD-619 665 Biochemical Fuel Cells, HC $5.00/MF $1.00.)

The ordinary juice of the coconut can be used to produce electricity. Researchers of Thompson Ramo Wooldridge in an Army-sponsored project have used bacteria to break down the coconut juice into a simpler form from which they extracted an electrical current. Such an electrical system, known as a biochemical fuel cell, can produce 150-watt hours per pound if operated for a 1000-hour period or more, the engineers predict. It has already been used to operate a transistor radio intermittently over a period of 45 days for a total operating time of 50 hours. The Army is interested in such a battery for remote military missions, but TRW engineers also note that it holds much promise for civilian application, particularly in remote (jungle) fuel-hungry areas and in more populated areas during emergencies. Campers would welcome such a power supply. In the present system, TRW workers used the bacterium Aeromonas formicans as a biological catalyst to convert the coconut juice into formic acid, from which one of the poles of the battery tapped an electrical current. Formic acid, the electrochemical fuel, can also be produced from sugar cane, fruits, and yams, and there is hope that a way may be found to produce it from ordinary leaves and grass.

Testing, Analysis

REVIEW OF ENVIRONMENT-SENSITIVE MECHANICAL BEHAVIOR

(Order AD-617 778 Environment-Sensitive Mechanical Behavior--Status and Problems, HC $3.00/MF 75 cents.)

During the past few years materials scientists have expressed a renewed interest in the study of environment-sensitive mechanical behavior, and this has led to improved understanding of some of such behavior; however, Martin Co. researchers advise that considerable work remains to be done. For example, they say it is no longer satisfactory to explain liquid metal embrittlement in terms of the reduction in surface free energy which accompanies absorption. It is instead necessary to obtain a better understanding of the electronic mechanisms by means of which certain absorbing species reduce cohesion locally and to determine why such an effect does not occur with other absorbents. Similarly, they say it is no longer satisfactory to remark about the specificity of environments which cause stress corrosion cracking. It is necessary to examine the chemistry of the SCC-inducing environments to determine the active constituents and then to determine their mode of action. It has also become apparent that water-containing environments must be taken more seriously, for the highly polar water molecule can significantly affect the strength of both metals (steels) and ceramics (MgO and TiC).

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TECHNICAL ABSTRACT BULLETIN

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AD-620 133 Div. 1/4
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
WORLD RECORD OF SOVIET AVIATOR,
by V. Novikov, and S. Frolkin. 18 Jun 65, 5p.
Rept. no. FTD-TT-65-544
TT, 65-63351
Unclassified report

Unedited rough draft trans. from Krasnaya Zvezda (USSR) 18 Apr 1p 1965.

Descriptors: (*Flight testing, Supersonic planes), (*Pilots, USSR), Flight speeds

AD-620 258 Div. 1/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
FURTHER ATTEMPTS AT CODING AIRCRAFT ACCIDENTS.
Research rept.,
by Wilse B. Webb, Elmo E. Miller, and Leonard M.Seale. 31 Jul 57, 11p. Proj. NM-15-01-11 Task 1
NAVMED, NM-15-01-11-1-2
Unclassified report

Descriptors: (*Aviation accidents, Analysis), Identification, Carrier landings, Pilots, Psychometrics, Aviation medicine

The accuracy of attempts to devise categories for the coding of accidents has been low. This study was confined to one specific accident event, the carrier landing phase of flight training, and the codes were derived from intensive follow-up interviews with accident participants. Thirty-eight pilot-caused accidents were independently coded by three coders using five psychological categories. Four separate coding sessions were held. Preceeding each coding session the codes were thoroughly discussed. The coding procedures developed showed little or no improvement over previous attempts at coding accidents. The major difficulty in accurate coding seems to lie in the fact that an error may stem from any one of a number of psychological sources. Further, neither the mental state nor the specific motor acts of the pilot during the time of the accident were available to the coder. (Author)

AD-620 277 Div. 1/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
MEASUREMENT OF STRESS ON MARTIN-BAKER EJECTION SEAT FACE CURTAIN.
Memorandum rept.,
by Arthur L. Hall, and Lynn A. Alford. 23 Oct 50, 6p. Proj. NM001 059 2201
NAVMED, NM-001-059-2201
Unclassified report

Descriptors: (*Ejection seats, Safety devices), Stresses, Analysis, Tests, Aviation safety

A study was conducted to determine the amount of static pull that could be exerted in situ on the face curtain of the Martin-Baker Ejection Seat. To measure the pull, a hydraulic pressure measuring device was fabricated and attached to the curtain handles. A selected population of 252 subjects completed three maximum pulls each on the curtain. Mean age, weight, and height was 23.5 years, 163.7 pounds and 5 feet 9-3/4 inches respectively. The mean average pull of all subjects was 57.3 pounds with a standard deviation of 14.4 pounds. The absolute range for single trials was 17 to 107 pounds. It is recommended that further studies of dynamic pull on the curtain in situ, maximum pull under ideal conditions, and the effect of positive 'g' on pull be made. (Author)

AD-620 325 Div. 1/5
CFSTI Prices: HC $1.00 MF $0.50
KRESGE EYE INST DETROIT MICH
THE USE OF ARTIFICIAL CONTRAILS TO INCREASE THE VISIBILITY OF AIRCRAFT.
Research rept.,
by James W. Miller. 12 Oct 59, 11p. Contract Nonr58600 Proj. NR142 023, MR005 13 6004 Task 2
NAVMED, MR005.13-6004-2-17
Unclassified report

Proj. MR005 13 6004 (Formerly NM17 01 99) Prepared in cooperation with Naval School of Aviation Medicine, Pensacola, Fla.

Descriptors: (*Aviation safety, Condensation trails), (*Aircraft, Visibility), Aviation accidents, Airborne, Smokes, Colors

Air-to-air visibility is discussed with regard to the possibility of using artificial contrails. It is emphasized that although the avoidance of mid-air collisions might be the single most important feature, the use of such contrails may be beneficial in numerous other situations. Experimental evidence obtained in the air, with the assistance of the U. S. Navy Blue Angels, demonstrated that the range of visibility, except for direct head-on courses, is increased from 6-8 miles to 20-24 miles by the use of rather thin white smoke. It is suggested that a smoke of greater density or a different color would increase this range even further. (Author)

AD-620 347 **See Fld. 1/5**

AD-620 370 Div. 1/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
COMPARISON OF DIFFERENT TYPES OF PARACHUTE HARNESS WITH PARTICULAR REFERENCE TO EASE OF RELEASE.
Research rept.,
by C. L. Gemmill, S. C. Stilwell, W. D. Dietz, R. L. Riley, and T. J. Zwierlein. 01944, 20p. Rept. no. NSAM-766
NAVMED, X-292 (Av-168-u)
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Parachutes, Safety harness), (*Disconnect fitting, Parachutes), Tests, Simulation, Environmental tests, Aviation safety, Release mechanisms

The U. S. Navy type and the British 'quick release' type of parachute harness were tested with respect to the ease and speed of release under the following conditions: (1) On land under good conditions. (2) On land in simulated bad weather: (a) In high wind, (b) With wet hands and harness, (c) At 0 F, (d) With heavy flying mittens. (3) In the water and suspended above the water: (a) In the water, (b) Suspended 8 ft. above water, (c) In the water; life jacket inflated. (4) Using one hand: (a) Dry, (b) With wet hands and harness. Two examples of accidental jamming are discussed and the subject of accidental release is considered. (Author)

AD-620 439 **See Fld. 4/2**

1/3. AIRCRAFT

AD-620 247 Div. 1/9
CFSTI Prices: HC $2.00 MF $0.50
KAMAN AIRCRAFT CORP BLOOMFIELD CONN
UH-2 JET-AUGMENTED HIGH-SPEED RESEARCH HELICOPTER MANEUVERABILITY AND DYNAMIC STABILITY EVALUATION.
Final rept.,
by W. E. Blackburn, and A. A. Whitfield. 0 Jul 65, 42p. Rept. no. R-553A
Contract DA44 177AMC151T Task 1D121401A14311
USAAVLABS, TR-65-23
Unclassified report

Descriptors: (*Helicopters, Maneuverability), (*Thrust, Dynamics), Stability, Flight testing, Aerodynamic loading, Jet engines, Damping, Pitch (Motion), Yaw, Gust loads, Acceleration

The results of a flight research program conducted to determine the effect of horizontal thrust augmentation on the maneuverability and dynamic stability characteristics of the UH-2 high-speed jet-augmented research helicopter are presented. The research aircraft, instrumentation, and test program are described. A standard Kaman UH-2 helicopter was modified by the addition of a General Electric YJ85 jet engine mounted on the right side of the fuselage for horizontal thrust augmentation. Transient and steady-state load factor maneuvers were examined at various airspeeds and levels of jet augmentation. The maneuver envelope is shown to be expanded by unloading the main rotor through the application of horizontal thrust augmentation. The dynamic stability characteristics of the research vehicle are shown to be basically similar to the standard UH-2. The addition of thrust augmentation tends to increase damping in pitch and yaw and reduce control sensitivity. (Author)

AD-620 312 Div. 1/2, 33/1
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS
GROUND FLOTATION REQUIREMENTS FOR AIRCRAFT LANDING GEAR.
Revised ed.,
by D. M. Ladd. 0 Jul 65, 68p. Rept. no. miscellaneous paper no. 4-459
Unclassified report

Available copy for sale from U. S. Army Engineer Waterways Experiment Station, Corps of Engineers, Vicksburg, Miss., $0.50; MF$0.75 available from CFSTI.

Descriptors: (*Landing fields, Trafficability), (*Landing gear, Flotation), Loading (Mechanics), Landing fields, Aircraft, Design

This paper presents criteria which can be used to assist the aircraft designer in designing a landing gear that will support a given aircraft load without overloading an airfield of stated strength. Seven classes of airfields are defined to which the curves presented specifically apply. (Author)

AD-620 367 Div. 1/2
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
INSTRUMENT FOR SERVICE TESTING DILUTERDEMAND OXYGEN EQUIPMENT IN AIRCRAFT: TESTING PROCEDURE AND MAINTENANCE OF.
Development rept.,
by Royce K. Skow. 17 Nov 45, 15p.
NAVMED, X-597 (Av-307-f)-2
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Oxygen equipment, Instruction manuals), Test equipment, Maintenance, Tests, Meters

That sufficient information on service testing equipment of the general type described has been compiled to warrant serious consideration of its application to field maintenance problems. (Author)

AD-620 442 Div. 1/2 ,9/6
CFSTI Prices: HC $3.00 MF $0.75
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF AERONAUTICS AND ASTRONAUTICS
LOW SPEED AERODYNAMIC CHARACTERISTICS OF JET VTOL AIRCRAFT AT ANGLES OF ATTACK.
Master's thesis,
by Donald Joseph Kutyna. 0 May 65, 90p. Contract AF33 608 1081

Unclassified report

Descriptors: (*Vertical take-off planes, Aerodynamic characteristics), Subsonic characteristics, Angle of attack, Pitch (Motion), Moments, Wind tunnels, Model tests, Experimental data

A VTOL model incorporating a lifting fan mounted vertically in the fuselage was tested in the M. I. T. Wright Brothers Wind Tunnel to examine the variations of the pitching moment and longitudinal forces with changes in the angle of attack and forward velocity. The model was tested at angles of attack between =90 degrees, but the results were considered reliable only up to +45 degrees due to stalling of the model fan blades. Moment was found to be unstable between the measured angles of attack from -45 degrees to +10 degrees, increasing moderately as angle of attack increased. An increase in the ratio of forward velocity to fan efflux velocity also produced an increased moment. A theory developed by A. R. Kriebel based upon a Fourier analysis of the vortex distribution on a thin cylindrical ducted fan was employed to predict the results of the experiment. Considering the simplifying assumptions used in the theory, the correlation was found to be reasonably good except at high ratios of free stream to fan efflux velocity. At these ratios, an uncompensated for low pressure area aft of the exhaust duct resulted in considerably erroneous predictions. Thrust generally increased with angle of attack and varied with the velocity ratio, the variation being related to the sign of the angle of attack. (Author)

AD-620 583 Div. 1/2 ,7/2
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
GENERAL IMPROVEMENT OF CONTROL ELEMENT OF REVERSE-CURRENT CUTOUTS,
by J. M. Marzolf. 9 Feb 48, 19p. Rept. no. NRL-3237

Unclassified report

Previously announced 2 Jun 53 as PB-111 132 LC mi $2.00, ph $2.75.

Descriptors: (*Aircraft, Electrical equipment), Circuits, Trigger circuits, Electric currents, Control systems, Thyratrons, Magnets

An investigation was undertaken to find a means of improving the performance of aircraft reverse-current cutouts. It was decided that, to be satisfactory, an ideal cutout designed for a 28-volt d-c aircraft system should close at a differential voltage between generator and bus of 0.2 volt and open under a reverse-current equal in magnitude to five percent of the generator fullload current. It should operate at the same values for any system voltage between 20 and 30 volts, any temperature between -55C and +70C, and severe conditions of vibration, shock, dust, humidity, and at any altitude up to 50,000 feet. It should be small in size and weight, should be simple and dependable in operation, and have a low power consumption. A circuit is proposed utilizing a permanent magnet control element to trigger a unique thyratron circuit, which, it is believed, will satisfactorily meet all the rigorous conditions imposed, if properly designed from a mechanical standpoint. (Author)

AD-620 673 **See Fld. 20/14**

AD-620 737 **See Fld. 19/6**

1/4. AIRCRAFT FLIGHT INSTRUMENTATION

AD-620 144 Div. 1/1 ,11/1
CFSTI Prices: HC $3.00 MF $0.75
GENERAL DYNAMICS CORP GROTON CONN ELECTRIC BOAT DIV
THE DESIGN OF AIR CUSHION VEHICLE AUTOMATIC AND SEMI-AUTOMATIC CONTROLS.
Final rept.,
by Frank J. Hannigan. 1 Jul 65, 85p. Rept. no. U-411-65-032
Contract NObs92050 Proj. SS215 000 Task 10302

Unclassified report

Descriptors: (*Control systems, Ground effect machines), (*Ground effect machines, Control systems), Automatic, Maneuverability, Mathematical models, Design, Equations, Motion, Yaw, Flight control systems

The report presents a practical technique for designing automatic and semi-automatic (quickened) control systems for air cushion vehicles (ACV's). These systems have been designed to minimize a major problem in ACV control, vehicular sideslip. General equations of five degrees of freedom of ACV dynamic operation are included from which a mathematical model can be derived; this derivation is also included. The design technique is valid for most vehicle configurations and examples of its application are included for three different control methods. The quickened concept is explained and results of its usage are included. Analog computer data is presented for turning maneuvers at the operating conditions for which the systems were designed as well as at off-design points. From the study that preceded this report it was concluded that an automatic, or a quickened, control system for an ACV offers distinct advantages over conventional manual control, particularly in minimizing sideslip and establishing and maintaining a command heading. (Author)

AD-620 344 **See Fld. 17**

AD-620 587 **See Fld. 9/1**

1/5. AIR FACILITIES

AD-620 292 **See Fld. 15/5**

AD-620 312 **See Fld. 1/3**

AD-620 347 Div. 33/1 ,1/4 ,32/6
CFSTI Prices: HC $3.00 MF $0.75
TENNESSEE UNIV KNOXVILLE
AN ANALYSIS OF LIABILITY IN AIRCRAFT TRESPASS AND NUISANCE CASES SINCE 1958.
Master's thesis,
by Raymond C. Robins. 0 Aug 65, 85p. Contract AF33 608 1118

Unclassified report

Presented to the Graduate Council of The University of Tennessee.

Descriptors: (*Jet plane noise, Law), (*Law, Jet plane noise), Sonic boom, Airports, Military facilities, United States Government, Airplane noise, Low altitude, Flight, Military law

The study discusses the nature of the aircraft noise problem, analyzes court cases involving jet noise around airports and military bases, and identifies the factors significant in determining whether noise constitutes a compensable damage. In the 1946 'United States v. Causby' case, the U. S. was held liable for the noise of Army planes that interfered seriously with the operation of Causby's chicken farm. In the 1962 'Griggs v. Allegheny County' case, the Supreme Court held the municipality operating the Greater Pittsburg Airport liable for aircraft noise, saying the county should have condemned enough property to prevent aircraft operations from interfering with adjacent landowners. The contention is made that (1) higher courts should insist on more consistent interpretation of the criteria used to determine when an easement has been taken, altitude alone being a less important factor than others, (2) intensity and frequency of noise and the use made of the property is more important than a line marking the property boundary, (3) rigid requirements should be set to insure adequate space for new airports, (4) solving the noise problem at existing airports should be a cooperative effort, and (5) determination of compensable noise damage should be made by courts with consideration more for degree of disturbance than for property boundaries.

AD-620 399 Div. 33/1
CFSTI Prices: HC $4.00 MF $1.00
TENNESSEE UNIV KNOXVILLE
A HISTORICAL ANALYSIS OF PIEDMONT AIRLINES.
Master's thesis,
by Frank E. Moore. 0 Aug 65, 141p. Contract AF33 608 1118

Unclassified report

Descriptors: (*Air transportation, Industries), (*Civil aviation, Industries), History, Industrial relations, Training, Transport planes, Aviation personnel, Civilian personnel

The development and progress of Piedmont Airlines from its origin to the present as a local air carrier are traced, and Piedmont's accomplishments are compared with those of similar air carriers. Emphasis is placed upon the following areas of airline management as applied specifically to Piedmont Airlines and generally to other local air carriers: (1) Certification, route structure, financing, subsidies, and operational policies; (2) Organization structure, industrial relations, and employee training; (3) Transition from the Douglas DC-3 to the Fairchild F-27 and Martin 404 aircraft.

AD-620 406 Div. 33/1 ,26/2
CFSTI Prices: HC $4.00 MF $0.75
TENNESSEE UNIV KNOXVILLE
A STUDY OF THE CIVIL AERONAUTICS BOARD POLICY TOWARD ROUTE STRUCTURE DEVELOPMENT OF DOMESTIC TRUNK CARRIERS.
Master's thesis,
by Donald G. Bisgrove. 0 Aug 65, 118p. Contract AF33 608 1118

Unclassified report

Descriptors: (*Air transportation, Air traffic), (*Civil aviation, United States Government), (*Air traffic, Civil aviation), Management planning, Management engineering

The study investigates the Civil Aeronautics Board's policy toward developing an economically sound airtransportation system through the selection of air carriers for new routes. This was accomplished by: (1) tracing the evolution of section 401 of the Act and the Board's responsibility therefor; (2) establishing the Board's policy toward selecting a carrier for a new route; (3) showing what effect the courts have had on Board route policy; and, (4) comparing Board policy in recent southern route development with previous route policy. Conclusions are that (1) the Board is to promote

a financially strong air-transportation industry capable of meeting the needs of the Post Office, commercial interests of the country, and national defense, (2) the Board does not have the power to predetermine a route system in advance and to tell each carrier the routes it must operate over, (3) a sound air-transportation system must be in existence before the public can derive the benefits of good transportation service, (4) direct route competition has been one of the Board's major problems, and (5) the Board has realistically followed the guidance set forth in the Act.

AD-620 433 Div. 33/1 ,26/2
CFSTI Prices: HC $5.00 MF $1.00
TENNESSEE UNIV KNOXVILLE
AN ANALYSIS OF CIVIL AERONAUTICS BOARD POLICY CONCERNING AIRLINE MERGERS.
Master's thesis,
by Carl M. Unterman. 0 Aug 65, 175p. Contract AF33 608 1118

Unclassified report

Descriptors: (*Aircraft industry, Management planning), (*Civil Aviation, United States Government), Economics, Employee relations, Management engineering

The study determines and analyzes the Civil Aeronautics Board's policy concerning airline mergers. This is accomplished by: (1) tracing the evolution of statutory authority granted the Board to regulate airline mergers; (2) analyzing specific decisions of the Board to determine Board policy; (3) analyzing the position of the courts in reviewing Board policy; and, (4) analyzing the impact of Board and court decisions on the economic condition of the carriers involved in the mergers. Conclusions are that (1) the CAB was given statutory authority by Congress because of realization that some mergers would be necessary, (2) the CAB has developed guiding criteria for evaluation in each case, rather than establishing a firm policy that will insure uniform application in all situations where unifications are proposed, (3) the courts have not been instrumental in setting CAB policy other than in affirming Board decision, (4) the primary advantage of the Board's merger policy in terms of national aviation objectives is the elimination of weak carriers that were receiving subsidy payments, (5) no dramatic results were achieved in terms of the impact of the Board's policy on the economic condition of the carriers involved, and (6) the actions of the CAB regarding mergers has been realistic and in consonance with sections 102 and 408 of the Federal Aviation Act.

AD-620 721 **See Fld. 5/9**

AD-620 722 **See Fld. 5/9**

2/5. ANIMAL HUSBANDRY

AD-620 701 **See Fld. 6/3**

3/1. ASTRONOMY

AD-620 117 Div. 2/1
CFSTI Prices: HC $3.00 MF $0.50
HAMBURGER STERNWARTE (GERMANY)
SPECTROPHOTOMETRY OF GALACTIC NEBULAE ORION NEBULA III.
Final scientific rept.,
by K. Wurm. 30 Nov 64, 58p. Contract AF61 052 259
AFCRL., 65-165

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Galaxies, Nebulae), (*Nebulae, Galaxies), (*Astrophysics, Nebulae), Physical properties, Spectroscopy, Photographic analysis, Plasma physics, Astronomical data, Graphics

The internal physical structure of the Orion Nebula has been investigated. A realistic model of the nebula has been developed, which deviates strongly from a symmetrically spherical model. The Trapezium stars are situated on one side of the radiating masses of the center, on the side to the observer. (Author)

AD-620 220 Div. 2/1
CFSTI Prices: HC $5.00 MF $1.00
AIR FORCE CAMBRIDGE RESEARCH LABS BEDFORD MASS
PHOTOMETRY OF THE SOLAR CHROMOSPHERE.
Environmental research papers (Doctoral thesis),
by Richard B. Dunn. 0 Jun 65, 159p. Rept. no. AFCRL-65-398 ,ERP-109
Proj. 7649 Task 764906

Unclassified report

Descriptors: (*Solar atmosphere, Optical properties), (*Astrophysics, Solar atmosphere), Hydrogen, Line spectrum, Optical analysis, Photographic analysis, Telescopes, Photometers, Photographic filters

This report describes observations and measurements, made when there was no eclipse, of the hydrogen line H alpha in the chromosphere as it is observed at the sun's limp through a 3.4-A birefringent filter centered on H alpha. Descriptions of the telescope system and the photometric reductions are given. The introduction describes representative observations currently available for study of the chromosphere at the limb. The instrumental profile determined from measurements of images of a bright star, of narrow prominence features, and of the solar limb, is compared with laboratory measurements. A solar limb darkening curve is derived from observations made through the chromosphere camera. The results of the study extend from r = 0.9 to the solar limb. The H alpha intensity gradient is measured on some of the best pictures of the chromosphere obtained in 1955 and 1958. Measurements of the halfwidths of 42 spicules disclose that the average half-width is 815 km. The average value of the central intensity of the spicule is 2.5 x 10000 ergs/sq. cm sec steradian. At heights from 1000 to 3500 km the spicules are brighter than the adjacent background by 15 percent. Above 3500 km the contrast rapidly increases until it attains a value of 5 to 1 at 9500 km. Concluding remarks suggest further photographic studies of the chromosphere. (Author)

AD-620 227 Div. 2/1
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP SANTA MONICA CALIF
A STOCHASTIC MODEL OF THE FORMATION AND SURVIVAL OF LUNAR CRATERS, II: APPROXIMATE DISTRIBUTION OF DIAMETER OF ALL OBSERVABLE CRATERS,
by A. H. Marcus. 0 Aug 65, 44p. Rept. no. RM-4681-PR
Contract AF49 638 700

Unclassified report

Descriptors: (*Astronomy, Moon), (*Moon, Terrain), (*Lunar environment, Terrain), Configuration, Mathematical prediction, Stochastic processes, Mathematical models

It is assumed that the number density of lunar craters evolves because of the arrival of new craters and the obliteration of earlier craters by the formation of more recent ones nearby. Approximations are developed which permit the calculation of the expected number density of all observable lunar craters as a function of crater diameter and of time. This result is applied to the meteoroidal impact hypothesis for the origin of lunar craters. It is shown that obliteration alone is not sufficient to explain observed crater diameter distributions. (Author)

AD-620 228 Div. 2/1
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP SANTA MONICA CALIF
A STOCHASTIC MODEL OF THE FORMATION AND SURVIVAL OF LUNAR CRATERS, III: FILLING AND DISAPPEARANCE OF CRATERS,
by A. H. Marcus. 0 Aug 65, 39p. Rept. no. RM-4682-PR
Contract AF49 638 700

Unclassified report

See also AD-620 227.

Descriptors: (*Astronomy, Moon), (*Moon, Terrain), (*Lunar environment, Terrain), Configuration, Mathematical prediction, Stochastic processes, Mathematical models

A previous model is extended to include the effects of the disappearance of craters due to filling by dust or lava. Both the age distribution and expected number density of lunar craters are obtained as functions of crater diameter and of time. These results are applied to the meteoroidal impact hypothesis of the origin of lunar craters. Good agreement is obtained with observed number densities on the lunar continents and maria. It is assumed that the rate of filling of craters on the continents corresponds to the rate of meteoritic accretion, and the rate of filling on the maria is 50 to 100 times larger than on the continents, corresponding to filling of mare craters by lava.

AD-620 242 Div. 2/1 ,2/4
CFSTI Prices: HC $3.00 MF $0.50
MANCHESTER UNIV (ENGLAND) DEPT OF ASTRONOMY
LUNAR COORDINATES AND THEIR DETERMINATION.
Interim scientific rept.,
by Zdenek Kopal. 3 May 65, 57p. Rept. no. ISR-1
Contract AF EOAR64 49
AFCRL., 65-589

Unclassified report

Descriptors: (*Moon, Photogrammetry), (*Photogrammetry, Moon), Surface properties, Rotation, Geodesics

The methods of determining the apparent lunar coordinates of a point of the surface of the Moon from a photographic plate are derived from first principles. The theory of the determination of relative heights of features on the lunar surface is rigorously formulated, together with the necessary formulae to account for the effects of solar limb darkening. A more general theory applicable to the case of photographs taken from a space-craft is also derived. A comprehensive account of the rotation of the Moon and optical librations is given. (Author)

AD-620 250 Div. 2/1
CFSTI Prices: HC $1.00 MF $0.50
CENTER FOR RADIOPHYSICS AND SPACE RESEARCH CORNELL UNIV ITHACA N Y
MEASUREMENT OF SOLAR RADIATION AT 430 MEGACYCLES.
Quarterly status rept. for 1 Feb-31 Jul 65,
by M. H. Cohen. 0 Aug 65, 8p. Rept. no. CRSR-203
Contract Nonr40127

Unclassified report

Descriptors: (*Radio astronomy, Solar radiation), (*Solar radiation, Radio astronomy), (*Extraterrestrial radio waves, Solar radiation), Ultrahigh frequency, Polarization, Measurement, Astrophysics, Solar flares

AD-620 346 Div. 2/1 ,4/4
OHIO STATE UNIV COLUMBUS
STUDY OF THE COMET-TAIL BANDS OF CO (+) WITH A VERY HIGH DISPERSION SPECTROGRAPH.
Master's thesis,

by San-ChiHu. 01965, 83p. Contract AF33 608 1095

Unclassified report

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Descriptors: (*Astrophysics, Molecular spectroscopy), (*Carbon compounds, Monoxides), (*Comets, Carbon compounds), (*Diatomic molecules, Band spectrum), Iron, Atomic energy levels, Electron transitions, Quantum mechanics, Optical instruments

AD-620 371 Div. 2/1 ,2/7
AIR FORCE CAMBRIDGE RESEARCH LABS BEDFORD MASS
LONG-TERM VARIATION OF SOLAR EXTREME ULTRAVIOLET FLUXES.
Environmental research papers,
by L. A. Hall, W. Schweizer, and H. E. Hinteregger. 4 Feb 65, 11p. Rept. no. AFCRL-65-436, ERP-111
Proj. 6688 Task 668806

Unclassified report

Pub. in Journal of Geophysical Research, v70 n9 p2241-2 May 1 1965. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Solar radiation, Periodic variations), Ultraviolet radiation, Solar spectrum

The aeronomical importance of the 27-day variation of the incident solar EUV fluxes observed from the OSO-1 satellite has been discussed recently. Existing observational knowledge of variations over longer periods of time is even less satisfactory than that concerning these 27-day variations, since no continuous EUV monitoring experiments were ever made before the launch of OSO-1. Inferences of long-term variations of absolute intensities in the solar EUV spectrum based on a few short-lived rocket experiments must be treated with caution. The significance of certain long-term variations which are apparently implied by measurements accomplished in rocket experiments with EUV monochromators are discussed. Solar fluxes observed at the peak of rocket trajectory are compared for August 23, 1961 and December 12, 1963. Some prominent lines, noticeably those of the higher ionization species, have suffered a decrease in intensity compared to the other lines. Since continuous satellite monitoring data are nonexistent for the dates of measurement, it is speculated that perhaps some of the spread of data points may be due to chance coincidence with minima or maxima in the 27-day variation. (Author)

AD-620 373 Div. 2/1 ,24/1
AIR FORCE CAMBRIDGE RESEARCH LABS BEDFORD MASS
AUTOMATIC CAMERA SYSTEM FOR SOLAR CORONA PHOTOGRAPHY.
Instrumentation papers,
by D. J. Davis Jr., W. R. McCann, V. A. Remillard, P. Beaudoin, and A. Thomas. 21 Dec 64, 11p. Rept. no. AFCRL-65-487 ,IP-73
Proj. 7661 Task 766102

Unclassified report

Pub. in Applied Optics, v4 p723-6 Jun 1965. (Copies not available to DDC or Clearinghouse customers). Prepared in cooperation with Device Development Corp., Waltham, Mass.

Descriptors: (*Astronomy, Photographic techniques), (*Solar corona, Photography), (*Astronomical cameras, Camera controls), (*Photographic techniques, Astronomy), Automatic, Tracking telescopes, Sun, Solar eclipses, Photographic equipment, Servomechanisms

An automatic camera system for solar corona photography during total solar eclipses was designed, fabricated, and used during the total solar eclipse of 20 July 1963. The system consisted of two cameras which were automatically programmed. One camera photographed the inner corona; the other camera photographed the outer corona. Each camera was mounted on a declination unit attached to an equatorial drive to track the sun. (Author)

AD-620 407 Div. 2/1
CFSTI Prices: HC $6.00 MF $1.25
COLORADO UNIV BOULDER
REPRESENTATIVE MODELS OF THE OBSERVED SOLAR WIND.
Doctoral thesis,
by Charles Keller Anderson. 01965, 264p. Contract AF33 608 1054

Unclassified report

Descriptors: (*Solar wind, ' Mathematical models), (*Astrophysics, Solar wind), Plasma physics, Hydrodynamics, Gas ionization, Solar radiation, Solar flares, Cosmic rays, Theory

Observed values of the physical parameters that define the solar wind are available from radar and spectral measurements of the lower corona and from space vehicle measurements of the interplanetary plasma. The problem is to reconcile these observations with the theory of the solar wind and to construct models which are consistent with both. Parker's hydrodynamical equations are solved by numerical methods with observed values used as constraints. With single-index polytropic models, about 10% of the temperature-velocity pairs observed by Mariner II can be matched with density-velocity pairs in the lower corona observed by radar. The other 90% require dualindex models: a low index in the lower corona to accelerate the solar plasma rapidly to supercritical velocities, and a high index farther out to reduce temperatures to the values observed. Conclusions derived from the analysis include the following: the observed solar wind can be represented by dual-index polytropic models; the solar plasma in the plane of the ecliptic is diverging more rapidly than it would for precisely radial flow; most of the plasma emanates from low heliographic latitudes; the solar plasma corrotates with the Sun for several solar radii beyond the photosphere. (Author)

AD-620 481 Div. 2/1
CALIFORNIA UNIV LOS ANGELES
SPECTROPHOTOMETRY OF THE WOLF-RAYET STAR GAMMA SUB 2 VELORUM,
by L. H. Aller, and D. J. Faulkner. 24 Jan 64, 9p. Contract AF AFOSR83 63 Proj. 9774 Task 977401
AFOSR , 65-1106

Unclassified report

Pub. in Astrophysical Journal, v140 p167-72 Jul 1 1964. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Astrophysics, Binary stars), (*Stars, Spectroscopy), Optical analysis, Spectrophotometers, Spectra (Visible + ultraviolet), Continuous spectrum, Line spectrum, Absorption spectrum, Chemical analysis

The brightest Wolf-Rayet star in the sky, the more luminous component of the binary gamma Velorum, is also of interest because it is one of the bluest stars known and has been measured in the rocket ultraviolet. Measurements of the energy distribution in the continuum and of the intensities of the brighter lines, due to helium, carbon, and oxygen, in various ionization stages, yield excitation temperatures dependent on the ionization stage, and a color temperature near 30000K. (Author)

AD-620 483 Div. 2/1
CALIFORNIA UNIV LOS ANGELES
SPECTROPHOTOMETRIC STUDIES OF GASEOUS NEBULAE. I. THE DOUBLE-RING PLANETARY NGC 7009,
by Lawrence H. Aller, and James B. Kaler. 16 Dec 63, 17p. Contract AF AFOSR83 63 Proj. 9774 Task 977401
AFOSR , 65-1107

Unclassified report

Pub. in Astrophysical Journal v139 p1074-80 May 1964. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Nebulae, Spectroscopy), (*Astrophysics, Nebulae), Planetary atmospheres, Gases, Optical analysis, Chemical analysis, Spectrophotometers, Line spectrum, Spectra (Visible + ultraviolet)

Spectrophotometric data obtained with a photoelectric spectrum scanner at Mount Wilson Observatory in 1956 and Mount Stromlo Observatory in 1961 are combined with photographic observations obtained with coude spectrographs at Mount Wilson and Lick Observatories to obtain line intensities and identifications in the spectral region lambda 3100- lambda 4960. Lines as weak as 0.02 on the scale I (H beta) = 100 are measured on the longest exposure. (Author)

AD-620 484 Div. 2/1
CALIFORNIA UNIV LOS ANGELES
SPECTROPHOTOMETRIC STUDIES OF GASEOUS NEBULAE. II. THE MODERATE-EXCITATION PLANETARIES NGC 6572 AND IC 4997.
Revised ed.,
by Lawrence H. Aller, and James B. Kaler. 17 Apr 64, 14p. Contract AF AFOSR83 63 Proj. 9774 Task 977401
AFOSR , 65-1108

Unclassified report

Pub. in Astrophysical Journal v140 p621-31 Aug 15 1964. (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 4 Mar 64.

Descriptors: (*Astrophysics, Nebulae), (*Nebulae, Spectroscopy), Planetary atmospheres, Gases, Optical analysis, Chemical analysis, Spectrophotometers, Line spectrum, Spectra (Visible + ultraviolet)

Observations made with the 100-inch coude spectrograph at Mount Wilson and the nebular spectrograph of the Crossley reflector at Lick Observatory are used to obtain line identifications and intensities in the wavelength region lambda lambda 3070-4940. Lines as faint as 0.02 on the scale I (H beta) = 100 are observed. (Author)

AD-620 493 Div. 2/1
PALOMAR OBSERVATORY PASADENA CALIF
ON A RECENT ABUNDANCE ANALYSIS OF 7 SEXTANTIS,
by Wallace L. W. Sargent, Leonard Searle, and GeorgeWallerstein. 26 Oct 63, 5p. Contract AF49 638 21 Proj. 9774 Task 977401
AFOSR , 65-1075

Unclassified report

Pub. in Astrophysical Journal v139 n3 p1015-7 Apr 1 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Astrophysics, Stars), (*Stars, Spectroscopy), Chemical analysis, Chemical compounds, Abundance

In an abundance analysis of the high-velocity A star, 7 Sextantis, by Wallerstein, Stone, and Williams (1962), one of the conclusions reached was that the He:H ratio in 7 Sex is about 10 and that C is overabundant by a factor of about 20. In the present note this is shown to be inaccurate and that 7 Sex has a normal composition in every respect. It is postulated that this inaccuracy possibly arose through adopting too low a temperature for 7 Sex. (Author)

AD-620 504 Div. 2/1 ,2/7
CFSTI Prices: HC $5.00 MF $1.00
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
COLLECTION OF ARTICLES ON THE INTERNATIONAL GEOPHYSICAL YEAR: ISSUE 2.
18 Aug 65, 156p. Rept. no. FTD-TT-65-335
TT , 65-63609

Unclassified report

Unedited rough draft trans. of Kiev Univ. Sbornik Rabot po Mezhdunarodonomu Geofizicheskomu Godu (USSR) n2 1963 104p.

Descriptors: (*Geophysics, USSR), (*Astronomy, USSR), (*Aurorae, Scientific research), (*Meteors, Scientific research), Astronomical observatories, Photography, Radio astronomy, Atomic properties, Molecular properties, Atmospheric electricity, Meteorological phenomena

The collection of articles consists of scientific papers prepared by members of the staff of the Kiev Astronomical Laboratory, on the basis of observations carried out as part of the International Geophysical Year program. The material is intended for specialists-astronomers, as well as for post-graduates and students specializing in the study of astronomy. The articles include: Photographic observations of meteors in 1958 at the Kiev Astronomical Laboratory; the physics of interaction between radio waves and meteor trains; the scattering of radiowaves from underdense meteor trains; the effect of the antenna directivity pattern on the observed distribution of meteoroids with respect to mass; the problem of classifying the spectra of polar aurorae; on the possibilities of elementary molecular and atomic ionization and dissociation processes in polar aurorae owing to hydrogen and helium ions from the sun; Corpuscular mechanisms for the excitation of ultraviolet emissions in polar aurorae; certain features of polar auroral forms with ray structure; certain problems relating to the local geographic distribution and dynamics of polar aurorae; and similarities between the Aurorae Borealis and Australis.

AD-620 505 Div. 2/1 ,2/7
CFSTI Prices: HC $2.00 MF $0.50
LIEGE UNIV COINTE-SCLESSIN (BELGIUM) INSTITUT D'ASTROPHYSIQUE
CELESTIAL SPECTRA AND ATMOSPHERIC EFFECTS MAINLY IN THE INFRARED.
Annual summary rept. no. 2, 1 Jun 64-31 May 65,
by M. Migeotte. 31 May 65, 44p. Contract AF61 052 685
AFCRL , 65-567

Unclassified report

Descriptors: (*Ozone, Atmosphere), (*Solar spectrum, Chemical analysis), (*Astrophysics, Spectroscopy), Atmosphere, Atomic spectroscopy, Molecular spectroscopy, Geophysics

Contents: Studies of the vertical distribution of telluric ozone; spectrum of the sun and of the earth's atmosphere; and investigations by interferometry of celestial spectra.

AD-620 507 Div. 2/1 ,25/4 ,30/5
CFSTI Prices: HC $1.00 MF $0.50
MANCHESTER COLL OF SCIENCE AND TECHNOLOGY (ENGLAND) DEPT OF PHYSICS
LABORATORY SIMULATION OF LUNAR LUMINESCENCE.
Annual summary rept., no. 1,
by J. E. Geake. 0 Apr 65, 11p. Rept. no. SSR-1
Contract AF61 052 798
AFCRL , 65-656

Unclassified report

Descriptors: (*Astrophysics, Lunar environment), (*Lunar environment, Luminescence), (*Luminescence, Lunar environment), (*Moon, Luminescence), Simulation, Surface properties, Extraterrestrial topography, Meteorites, Excitation, Proton bombardment, Spectroscopy

The luminescence of possible lunar surface materials, including a range of different types of meteorite, is investigated. A beam of protons is used to excite luminescence. The luminescence spectrum is analyzed by means of a photoelectric grating spectrophotometer.

AD-620 520 Div. 2/1 ,2/2
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF RADIO AND ELECTRICAL ENGINEERING
THE STEREOGRAPHIC PROJECTION,
by Bruce A. McIntosh. 01965, 7p. Rept. no. NRC-8456

Unclassified report

Pub. in Journal of the Royal Astronomical Society of Canada v59 n4 p155-60 Aug 1965 (Copies available only to DDC users).

Descriptors: (*Astronomy, Meteors), (*Map projection, Celestial mechanics), (*Celestial mechanics, Map projection), (*Meteors, Mapping), Geodesics, Maps, Stereoscopic projectors, Stereoscopic map plotters

The theory of the stereographic projection is reviewed and some applications in meteor astronomy are discussed briefly. It is shown that the grid lines for a hemispherical projection may be plotted with an accuracy sufficient for most purposes by drawing only arcs of circles. (Author)

AD-620 550 Div. 2/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
ECLIPSE AREA AND ECLIPSE FUNCTION CALCULATIONS,
by David B. Beard. 7 Jan 48, 19p. Rept. no. NRL-3212

Unclassified report

Previously announced 2 Jun 53 as PB-108 777, LC mi$1.75, ph$2.50.

Descriptors: (*Solar eclipses, Numerical analysis), Solar radiation, Brightness, Measurement

Description of methods of calculation of tables which are presented, including, (1) exposed areas of sun eclipsed by moon whose diameter is 1.04 of the sun's diameter, (2) areas when diameters are equal in size, including corona out to 1.5 of the radius of the sun and (3) variation in intensity of radiation from sun for 1.04 eclipse. (Author)

AD-620 615 Div. 2/1
CALIFORNIA INST OF TECH PASADENA
ON CHANDRASEKHAR'S LIMITING MASS FOR ROTATING WHITE DWARF STARS,
by S. P. S. Anand. 24 May 65, 4p. Contract Nonr22047 ,NASA NGR05 002 028

Unclassified report

Pub. in Proceedings of the National Academy of Sciences v54 n1 p23-6 Jul 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Stars, Celestial mechanics), (*Celestial mechanics, Stars), (*Astrophysics, Stars), Rotation, Mass spectroscopy

AD-620 616 Div. 2/1
CALIFORNIA INST OF TECH PASADENA
MASSIVE STARS AND STRONG RADIO SOURCES,
by William A. Fowler. 24 Apr 64, 10p. Contract Nonr22047 ,NASA NGR05 002 028

Unclassified report

Pub. in American Philosophical Society v109 n3 p181-8 Jun 1965 (Copies not available to DDC or Clearinghouse customers). Available from American Philosophical Society, Independence Square, Philadelphia, Pa., 19106, $1.00.

Descriptors: (*Stars, Radio astronomy), (*Radio astronomy, Stars), (*Astrophysics, Stars), Sources, Extraterrial radio waves, Energy conversion, Thermonuclear reactions

AD-620 619 Div. 2/1
AIR FORCE CAMBRIDGE RESEARCH LABS BEDFORD MASS
ORIGIN OF LINEAR ELEMENTS ON MARE HUMORUM.
Environmental research paper,
by John W. Salisbury, Vern G. Smalley, and Luciano B.Ronca. 01965, 19p. Rept. no. AFCRL-65-485 ,ERP-117
Proj. 8602 Task 860205

Unclassified report

Pub. in Nature v206 n4982 p385-8 Apr 24 1965 (Copies available only to DDC users).

Descriptors: (*Moon, Terrain), (*Astronomy, Moon), Lunar environment, Photogeology, Mapping

Major lunar features, such as the craters and maria, have been the subject of such a long and sometimes bitter controversy that minor lunar features have generally received little attention. As a result, little is known about features such as rilles, wrinkle ridges and rays. As linear elements, they have two properties which can be compared: length and direction. The purpose of this article is to report the results of an examination of linear elements on Mare Humorum in which possible interrelationships of these elements are explored.

AD-620 622 Div. 2/1
AIR FORCE CAMBRIDGE RESEARCH LABS BEDFORD MASS
RADIO STAR SCINTILLATION DURING THE JULY 20, 1963, ECLIPSE.
Environmental research papers,
by R. S. Allen, J. A. Klobuchar, W. C. Kidd, and H. E. Whitney. 7 Oct 64, 19p. Rept. no. AFCRL-65-542 ,ERP-122
Proj. 4643 Task 464302

Unclassified report

Pub. in Canadian Journal of Physics v43 p1050-8 Jun 1965 (Copies available only to DDC users).

Descriptors: (*Astrophysics, Radio astronomy), (*Radio astronomy, Solar eclipses), (*Solar eclipses, Radio astronomy), Galaxies, Extraterrestrial radio waves, High frequency, Very high frequency, Electron density, Ionosphere, Atmospheric refraction, Stars

Amplitude scintillations of the radio energy from the galactic radio source Cassiopeia A were examined for the total solar eclipse of July 20, 1963, using the 150-foot parabolic antenna at the AFCRL Sagamore Hill Radio Observatory, Hamilton, Massachusetts. The extent of eclipsing varied along the ionospheric ray path from 100% at about 100 km to about 80% near 500 km. Chart recordings of the amplitude variations of the Cassiopeia A signal were made at frequencies of 29.8, 63, 113, and 228 Mc/s. The extent of variation in amplitude and rate of scintillation was comparable to that on control days. Examination of the frequency dependence showed that the scale size of the irregularities did not change significantly during the period of the eclipse. No effects in the scintillation records could be related uniquely to the reduction of ionizing illumination and subsequent cooling of the medium. (Author)

AD-620 665 Div. 2/1
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP SANTA MONICA CALIF
A COSMOLOGICAL KINEMATICS WITH PECULIAR MOTIONS,
by Dominic G. B. Edelen. 0 Aug 65, 42p. Rept. no. P-3185

Unclassified report

Descriptors: (*Celestial mechanics, Relativity theory), Line spectrum, Differential geometry, Astronomy

The purpose of the discussion is to derive a line element without the assumptions of uniform mass density and the absence of peculiar motions, and then to derive the kinematical consequences of such a line element when the peculiar motions are included from the start. The results obtained in this manner, although similar in structure to those obtained from use of the Weil postulates, contain certain fundamental departures from previous thinking, and cast a certain amount of doubt on the velocityred-shift relations as currently interpreted.

AD-620 708 Div. 2/1 ,12/1
UNIVERSITY OF WESTERN ONTARIO LONDON
LABORATORY ASTROPHYSICS AND SPACE SCIENCE,
by R. W. Nicholls, and H. I. S. Ferguson. 01963, 9p. Contract AF19 628 2820 Grant ,AF AFOSR 62 236A Proj. 9768 Task 976801
AFOSR , 65-1094

Unclassified report

Pub. in Canadian Aeronautics and Space Journal, v10 n6 p163-8 Jun 1964. (Copies available only to DDC users).

Descriptors: (*Astrophysics, Scientific research), (*Astronautics, Scientific research), Ablation, Diatomic molecules, Impact flash, Powders, Spectroscopy, Shock waves, Excitation, Atomic spectroscopy, Molecular spectroscopy, Band spectrum, Physics laboratories, Canada

Contemporary problems of space physics, atmospheric physics, meteor and re-entry physics, and propulsion require for their solution much more of the basic data of atomic, molecular, and nuclear physics and chemistry than are currently available. Research in the general field of laboratory astrophysics supplies such basic data. Some of the current activities of the research program in laboratory astrophysics at the University of Western Ontario are reviewed. Included are spectroscopic studies on important diatomic molecular spectra, studies of shock excitation of powdered solids, and ablation and impact flash studies in a ballistic pellet range. (Author)

AD-620 728 **See Fld. 22**

AD-620 801 Div. 2/1 ,8/1
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C
RADIO ASTRONOMY ANTENNAS AND PROCESSING OF RADIO ASTRONOMY DATA.
Compilation of abstracts.
13 Sep 65, 20p. Rept. no. ATD-P-65-67 ,1 TT , 65-63845

Unclassified report

Rept. on Surveys of Soviet Scientific and Technical Literature.

Descriptors: (*Radio astronomy, Bibliographies), (*Antennas, Radio astronomy), Extraterrestrial radio waves, Radio reception, Signal-to-noise ratio, Astronomical data, Analysis, USSR, Astrophysics, Reviews

This report has been prepared in response to ATD Work Assignment No. 79-16 and is the first in a series reviewing Soviet developments in radio astronomy antennas and processing of radio astronomy data. Abstracts contained in the report were selected from Soviet open-source literature available at the Aerospace Technology Division and the Library of Congress. The report covers the period from February 1963 through December 1964. Information not directly related to the assigned subject has been included because of its broad implications for study in this field. The 48 abstracts are arranged alphabetically by author. Earlier information (1958-1963) on the subject can be found in A1D Report B-64-11 (AD-431 787), an annotated bibliography carrying the same title as the present report. (Author)

4/2. METEOROLOGY

AD-620 221 Div. 2/7
CFSTI Prices: HC $2.00 MF $0.50
NAVY UNDERWATER SOUND LAB NEW LONDON CONN
WIND-SPEED AND WIND-DIRECTION DISTRIBUTIONS AT ARGUS ISLAND OFF BERMUDA.
Research rept.,
by Anthony J. Perrone, John M. Gorman, and Francis G. Weigle. 24 Aug 65, 29p. Rept. no. USL-683
Proj. S-F001-03-15-11286

Unclassified report

Descriptors: (*Wind, Marine meteorology), (*Weather stations, Marine meteorology), (*Marine meteorology, Weather stations), Atlantic Ocean, Towers, Wind-direction indicators, Anemometers, Data processing systems

Argus Island wind information was systematically recorded and processed over a three-year period. The recording, processing, and analysis procedures used are described. Monthly mean wind speeds with standard deviations are compared with monthly median wind speeds and quartiles. Monthly distributions of wind speed are given, as well as yearly distributions. Cumulative distribution plots compare wind-speed occurrences over the three-year period. A time plot of daily mean and maximum wind speeds is given, and diurnal variations are discussed. The distributions of wind direction for each month are also shown. (Author)

AD-620 243 Div. 2/7 ,2/6
CFSTI Prices: HC $1.00 MF $0.50
SHEFFIELD UNIV (ENGLAND) DEPT OF APPLIED MATHEMATICS
A POSSIBLE EXPLANATION OF THE APPLETON ANOMALY OF THE F2 LAYER-II: A MODEL WITH UNEQUAL HORIZONTAL VELOCITIES.
Scientific rept.,
by D. W. Windle, and P. C. Kendall. 01965, 14p. Rept. no. SR-3
Contract AF EOAR64 74
AFCRL , 65-621

Unclassified report

Prepared in cooperation with Geophysical Inst., Univ. of Alaska, College. Prepared for presentation in the Journal of Atmospheric and Terrestrial Physics.

Descriptors: (*Ionosphere, Atmosphere models), Terrestrial magnetism, Plasma physics, Electron density, Gas flow, Air, Ionization, Diffusion

The effects of an assumption that the neutral air in the F2 layer is set in horizontal motion by the ionization are examined. It is assumed that the horizontal velocity of the neutral air is a fixed proportion of the horizontal velocity of the ionization. The model F2 layer discussed is in equilibrium at noon and there is no electrodynamic drift. The earth's magnetic field is assumed to be that of a geocentric dipole whose axis coincides with the earth's axis of rotation. The sun's radiation is assumed to be symmetrically incident on the earth. It is found that the theoretical enhancement of the equatorial trough in N sub m, discovered when the horizontal velocities are the same is only present to a marked degree when the horizontal velocities differ by 2.5% or less. However, although moderate induced horizontal winds may have little effect on the shape of the equatorial trough, they do affect the overall magnitude of N and N sub m by a factor which may be as large as three. (Author)

AD-620 244 Div. 2/7 ,2/6 ,25/3
CFSTI Prices: HC $2.00 MF $0.50
SHEFFIELD UNIV (ENGLAND) DEPT OF APPLIED MATHEMATICS
ON THE MAGNETOHYDROSTATIC CAVITY FORMED ROUND A SYSTEM OF LINE CURRENTS IN AN INFINITELY CONDUCTING ATMOSPHERE; A TWO DIMENSIONAL CONFIGUREATION.
Scientific rept.,
by Angela M. Downs, R. C. Hewson-Browne, and Astrik Deirmendjian. 1 May 65, 27p. Rept. no. SR-4
Contract AF EOAR 64 74
AFCRL , 65-622

Unclassified report

Prepared in cooperation with the High Altitude Observatory, Boulder, Colo.

Descriptors: (*Magnetohydrodynamics, Cavitation), (*Magnetic storms, Atmosphere models), Electric currents, Upper atmosphere, Hydrostatic pressure, Electrical conductance, Terrestrial magnetism, Conformal mapping

A fluid of infinite electrical conductivity without an internal magnetic field and at uniform pressure is in equilibrium outside an infinitely long irregular cylindrical cavity. The cavity is prevented from collapsing by the magnetic field of a finite number of line currents parallel to the axis of the cylinder. The systematic method of solution of this problem is given in the case when the trace of the cavity is a single, simply connected region. The character of the solution is governed by the number of magnetic neutral points inside the cavity, as well as the nature of the magnetic singularities. The method is illustrated by considering the case of two unequal line currents, and the case of a dipole with equal and oppositely-directed line currents at equal distances on either side. It is shown that the solution can be extended to cases when the external hydrostatic pressure is nonuniform. In illustration, the cases of a line current and a line dipole immersed in an exponential atmosphere are considered. (Author)

AD-620 354 **See Fld. 18/8**

AD-620 371 **See Fld. 3/1**

AD-620 388 Div. 2/7
CFSTI Prices: HC $2.00 MF $0.50
OKLAHOMA UNIV NORMAN
A STUDY OF OROGRAPHICALLY DISTURBED FLOW.
Master's thesis,
by George P. P. Emodi. 01965, 49p. Contract AF33 608 1096

Unclassified report

Descriptors: (*Terrain, Atmospheric motion), (*Mountains, Gas flow), (*Atmospheric motion, Vortices), Reynolds number, Turbulence, Clouds, Boundary layer, Wind, Atmosphere

AD-620 394 Div. 2/3 ,2/5 ,2/7
CFSTI Prices: HC $3.00 MF $0.75
TEXAS A AND M UNIV COLLEGE STATION DEPT OF OCEANOGRAPHY AND METEOROLOGY
AN INVESTIGATION OF THE RAINFALL DISTRIBUTION OF A MESOSCALE NETWORK IN ECUADOR.
Master's thesis,
by Tommy Dean Guest. 0 Aug 65, 69p. Contract AF33 608 1120

Unclassified report

Descriptors: (*Rainfall, Ecuador), Climatology, Hydrology, Meteorology, Geography

This study provides a preliminary investigation of the mesoscale rainfall distribution of two geographical areas. The spatial distribution of rainfall at San Carlos, Ecuador, is compared with the spatial distribution at Riesel, Texas. This study is based upon four methods of investigation: isohyetal patterns, contingency index, product-moment correlation coefficient, and depth-area relations. The basic data for this study was the daily rainfall of the 1964 wet season (December 23, 1963 to April 29, 1964) at San Carlos and the daily rainfall of the 1960-1964 warm seasons (May through September) at Riesel. The isohyetal patterns and the depth-area relations show that rainfall often varies greatly over short distances. A relationship exists between the contingency index and the correlation coefficient and plots of these parameters indicate that the wet season rainfall distribution at San Carlos is similar to the warm season rainfall distribution at Riesel. (Author)

AD-620 396 Div. 2/7 ,8/6
CFSTI Prices: HC $2.00 MF $0.50
WISCONSIN UNIV MADISON
INTERRELATION OF IONOSPHERIC SPORADIC E WITH THUNDERSTORMS AND JET STREAMS.
Master's thesis,
by Thomas Deloyd Damon. 01965, 42p. Contract AF33 608 1133

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Ionospheric disturbances, Thunderstorms), (*Thunderstorms, Ionospheric disturbances), (*Jet streams (Meteorology), Ionospheric disturbances), Electron density, Ionosphere, Atmospheric sounding, Ionospheric propagation, Radio waves, Radiofrequency interference, Geophysics

Reports of the occurrence of ionospheric sporadic E clouds from radio amateurs operating on a frequency near fifty megahertz are analyzed on a synoptic scale and compared with the occurrence of thunderstorms and of jet streams. A mechanism is suggested for the observed interrelation between Es and thunderstorms. No definite conclusion is drawn concerning the possible relationship between Es and jet streams. (Author)

AD-620 439 Div. 2/7 ,1/4 ,18/4
CFSTI Prices: HC $3.00 MF $0.75
SAINT LOUIS UNIV MO
AN ANALYSIS OF NUMERICAL CLOUD FORECASTS. A STATISTICAL ANALYSIS OF TOTAL CLOUD COVER FORECASTS PRODUCED BY TWO AIR WEATHER SERVICE NUMERICAL PROGRAMS.
Master's thesis,
by Robert Edward de Michaels. 01965, 61p.
Contract AF33 608 1115

Unclassified report

Descriptors: (*All-weather aviation, Weather forecasting), (*Cloud cover, Mathematical prediction), (*Weather forecasting, Cloud cover), Air force operations, Meteorological parameters, Northern Hemisphere, Statistical analysis, Mathematical models

The Air Weather Service, USAF, has a requirement to provide total cloud cover forecasts for the northern hemisphere. Three approaches were made to provide numerical forecasting programs to meet this requirement: (1) A 'Dynamic Cloud Forecasting Model' based upon forecasting the trajectories of air parcels; (2) A '4-layer Cloud Forecasting Model' based upon the forecasting of adiabatic vertical velocities and a statistical correlation between cloud cover and the forecast dewpoint depression; and (3) a 'Multiple-discriminant Analysis' program developed by applying statistical techniques to determine a minimum number of predictors which would most efficiently forecast total cloud cover by statistical methods.

AD-620 459 Div. 2/7 ,8/6
CFSTI Prices: HC $3.00 MF $0.75
NAVAL ORDNANCE LAB CORONA CALIF
STATISTICAL EVALUATION OF SFERICS DISTRIBUTION,
by J. N. Martin, and V. E. Hildebrand. 16 Aug 65, 98p. Rept. no. NOLC-628
Proj. WR5 0062

Unclassified report

Descriptors: (*Statistical analysis, Atmospherics), (*Atmospherics, Statistical analysis), Thunderstorms, Meterological parameters, Reliability, Very low frequency, Noise (Radio)

Several thousand sferics direction-of-arrival photographs have been analyzed and averaged to give monthly average sferics activity as a function of direction-ofarrival at the NOLC field site. The information on thunderstorm frequencies throughout the world, as given in the United States Air Force Handbook of Geophysics, was analyzed to give rough predictions of the expected sferics activity. All results are given in the form of bar graphs that show predicted and measured values of the relative sferics activity for each 6 deg azimuthal sector. The predicted and measured values are similar in many respects, but significant differences do occur. (Author)

AD-620 464 See Fld. 8/14

AD-620 504 See Fld. 3/1

AD-620 505 See Fld. 3/1

AD-620 610 Div. 2/7
STANFORD RESEARCH INST MENLO PARK CALIF
JET-STREAM STRUCTURE OVER THE CENTRAL UNITED STATES DETERMINED FROM AIRCRAFT OBSERVATIONS.
Environmental research papers, (revised ed.),
by R. M. Endlich, and G. S. McLean. 16 Sep 64, 17p. Contract AF19 628 3304 Proj. 8624 Task 862402
AFCRL ,ERP 65-541; ,121

Unclassified report

Revision of manuscript submitted 1 Jul 64. Pub. in Journal of Applied Meteorology v4 n1 p83-90 Feb 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Jet streams (Meteorology), Air mass analysis), Atmospheric sounding, Research planes, Atmospheric motion, Mathematical models, Meteorology

Aircraft observations over the central United States are used to construct empirical models of jet streams that agree well with models based on data from other regions of the mid-latitudes. Individual jet streams conform to speeds of the model within certain limits. These limits are represented by a percentage variability that is larger to the north of the jet core than to the south. On the other hand, variations in the structure of the average speed field with season and with position in the upper flow appear to be rather small so that a single model describes the jet stream adequately. The field of average transverse wind component indicates appreciable motion toward high pressure in a layer beneath the jet-stream core. Average mesoscale vertical motion as large as -0.4 m/sec occurs below and slightly north of the core. Turbulence has a minimum frequency of occurrence at the maximum wind level immediately south of the jet core. Vertical wind shear has appreciably larger magnitudes than thermal wind shear in two shallow layers separated by the maximum wind level. The vorticity field corresponding to the wind and temperature fields is described. Several unexplained features of jet streams are mentioned briefly. (Author)

AD-620 614 Div. 2/7
AIR FORCE CAMBRIDGE RESEARCH LABS BEDFORD MASS
MOLECULAR OXYGEN DISTRIBUTION IN THE UPPER ATMOSPHERE, 2.
Environmental research papers, (revised ed.),
by A. S. Jursa, M. Nakamura, and Y. Tanaka. 2 Mar 65, 13p. Rept. no. AFCRL-65-540 ,ERP-120
Proj. 8627 Task 862703

Unclassified report

Pub. in Journal of Geophysical Research v70 n11 p2699-702 Jun 1, 1965 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript received 22 Dec 64.

Descriptors: (*Upper atmosphere, Oxygen), (*Oxygen, Upper atmosphere), Distribution, Photometers, Absorption spectrum, Atmospheric sounding

Successful rocket experiments in March 1963 and in September 1963 yielded data on the distribution of molecular oxygen in the earth's upper atmosphere in the region 90 to 120 km. The technique used was that of photographic photometry of absorption spectrograms. Results derived from fourteen spectrograms obtained in the altitude region mentioned above supplement results we published in 1963. The present results and the earlier results are compared with other recent experimental and theoretical determinations of the O2 distribution in the upper atmosphere as reported by several investigators. (Author)

AD-620 678 Div. 2/7
CFSTI Prices: HC $2.00 MF $0.50
INTERNATIONAL BUSINESS MACHINES CORP CAMBRIDGE MASS
ATMOSPHERIC DENSITY DETERMINATION BY A NUMERICAL INTEGRATION PROCEDURE.
Scientific rept. for Jul 64-Mar 65,
by Arnold S. Bramson, and Jack W. Slowey. 0 May 65, 27p. Rept. no. SR-1
Contract AF19 628 4192 Proj. 6690 Task 669005
AFCRL , 65-416

Unclassified report

Descriptors: (*Atmospheric sounding, Numerical methods + procedures), (*Numerical methods + procedures, Atmospheric sounding), Atmosphere, Density, Measurement, Satellites (Artificial), Drag, Perturbation theory, Numerical analysis, Integration, Data processing systems, Programming (Computers), Atmosphere models

Atmospheric density determination may be carried out by a careful reduction of satellite observations over long periods of time. The particular approach currently being investigated consists of a numerical integration procedure combined with a differential correction scheme where discrepancies between computed and observed satellite position and velocity are reconciled by adjusting the assumed atmospheric model, thereby yielding corrected or refined density data. An important advantage of this technique is its applicability to satellites entering the decay stage where the effects of atmospheric drag are considerable and relatively few observations are available. This report describes a numerical integration computer program which has been written and which is capable of simulating the motion of a satellite distrubed by various perturbative forces. (Author)

AD-620 682 Div. 2/7
CFSTI Prices: HC $3.00 MF $0.75
PARAMETRICS INC WALTHAM MASS
A ROCKET BORNE AIR DENSITY MEASUREMENT SYSTEM UTILIZING ELECTRON-BREMSSTRAHLUNG: DESIGN AND DEVELOPMENT.
Scientific rept. no. 1, Sep 61-Jul 65,
by Bach Sellers, and Charles A. Ziegler. 0 Jul 65, 89p. Contract AF19 628 5068 Proj. 6690 ,6682 Task 669001 ,668207
AFCRL , 65-507

Unclassified report

Descriptors: (*Atmospheric sounding, Sounding rockets), (*Sounding rockets, Radiation measurement systems), (*Radiation measurement systems, Sounding rockets), Ionosphere, Electron beams, Bremsstrahlung, X rays, Air, Density, Proportional counters

Research and development concluding with the design and construction of a rocket borne air density measurement system is reported. This system utilizes detection of bremsstrahlung X-rays generated by injection of an electron beam from the rocket into the atmosphere. At the high altitudes at which this system is designed to operate, between 100 and 200 km, the detected X-ray flux is linearly related to ambient air density. The theoretical treatment of this system is presented, and laboratory experiments carried out at A.F.C.R.L. to verify this treatment are reported. An operational description of the rocket data retrieval system, design considerations associated with incorporation of the electron-bremsstrahlung method into a rocket borne package, and the density-calibration of the actual flight package in the N.A.S.A. Langley 60 foot diameter sphere, are presented. It is concluded that the system operates as theoretically predicted, and that further research on the possibility of utilizing this technique to measure atmospheric parameters other than density, such as the argon/nitrogen ratio, is warranted. (Author)

AD-620 705 . See Fld. 7/4

AD-620 799 Div. 2/7 ,2/3 ,2/5
CFSTI Prices: HC $3.00 MF $0.75
BATTELLE MEMORIAL INST COLUMBUS OHIO RE

THE STRUCTURE OF THE ATMOSPHERE IN AND ABOVE TROPICAL FORESTS.
Rept. on Proj. Agile,
by Robert C. Behn, and Richard A. Duffee. 1 Aug 65, 69p. Rept. no. BAT-171-8
Contract SD171
Unclassified report

Descriptors: (*Micrometeorology, Jungles), (*Trees, Micrometeorology), (*Jungles, Micrometeorology), Atmosphere, Ecology, Geography, Climatology, Meteorological parameters, Tropical regions, Solar radiation

The report discusses the structure of the atmosphere and the microclimatology in and above tropical forests. The temperature, temperature inversions, wind, wind speed, humidity, evaporation rates, illumination, and the effects of seasons, day, and night on the temperature and humidity in tropical forests and above the canopy are reported. The effect of vegetation on the transmission of solar radiation into the forests and the radiometeorological characteristics of the atmosphere above the canopy are also mentioned. (Author)

5/1. ADMINISTRATION AND MANAGEMENT

AD-620 172 Div. 26/2 ,15/1 ,32/4
CFSTI Prices: HC $1.00 MF $0.50
CARNEGIE INST OF TECH PITTSBURGH PA GRADUATE SCHOOL OF INDUSTRIAL ADMINISTRATION
DATA, MODELING AND DECISIONS.
Management sciences research rept.
by A Charnes, and W. W. Cooper. 0 Jun 65, 14p. Rept. no. MSRR-43
Contract Nonr76024 Proj. NR-047-048
Unclassified report

Prepared in cooperation with Northwestern Univ., Evanston, Ill., Contract Nonr122810, Proj. NR-047 021. Presented at the June 15,1965, session, Using the New Tools to Improve Decision Making at the ,American Marketing Association's 'World Congress on Marketing at the New York Hilton Hotel.

Descriptors: (*Management engineering, Operations research), (*Operations research, Management engineering), Mathematical models, Decision making, Mathematical programming, Data, Optimizations

Past experience with models--and related methods of analysis--may be an inadequate guide for managers considering a use of new tools now available. The latter, viewed as multiple-variable systems models, may differ in their data requirements and decision possibilities in comparison with predecessors that could handle only a few variables at a time. In approaching these new tools it is desirable to consider using the models as guides to data collection as well as decisions. This refers not only to data variety but also to data quality as judged by reference to the model itself. It may then be possible to eliminate needless expenditures of time and money on collecting or refining data. It is also desirable to consider integrating the modelling and decision making. Evaluations may then be secured which can guide alterations to the model and also open new decision possibilities which would otherwise not be apparent. The value of such a joint approach to data, models and decisions is examined and illustrated in the following article with special reference to media mix and new products marketing applications. (Author)

AD-620 173 Div. 26/2 ,30/1
CFSTI Prices: HC $2.00 MF $0.50
CARNEGIE INST OF TECH PITTSBURGH PA GRADUATE SCHOOL OF INDUSTRIAL ADMINISTRATION
DECISION CPM: A METHOD FOR SIMULTANEOUS PLANNING, SCHEDULING AND CONTROL OF PROJECTS.
Management sciences research rept.,
by W. Crowston, and G. L. Thompson. 0 Jun 65, 35p. Rept. no. MSRR-45
Contract Nonr76024 Proj. NR-047-048
Unclassified report

Descriptors: (*Scheduling, Management planning), (*Management planning, Decision theory), (*Management control systems, Scheduling), Costs, Management engineering, Operations research, Mathematical programming

In the planning phase of the Critical Path Method a project graph is constructed which lists the jobs to be done as well as their technological ordering. Implicit in this process is a series of decisions on the best method of performing each job. The authors show that it is not possible to make these decisions optimally without the use of scheduling information. It is suggested that the planning and scheduling problems be solved simultaneously. A decision project graph is defined, which includes information on alternative methods of performing each job, the time and cost of the alternatives and the interdependencies between alternatives, as well as the usual technological ordering. Integer programming and heuristic solution techniques are developed for the joint problem represented by the decision project graph. Finally implications of the approach for project crashing and project control are discussed. (Author)

AD-620 174 **See Fld. 12/1**

AD-620 175 Div. 30/1 ,26/2
CFSTI Prices: HC $1.00 MF $0.50
CARNEGIE INST OF TECH PITTSBURGH PA GRADUATE SCHOOL OF INDUSTRIAL ADMINISTRATION
OPTIMAL REAL-TIME CONTROL OF RESEARCH FUNDING.
Management sciences research rept.,
by A. Charnes, and A. C. Stedry. 0 Aug 65, 17p. Rept. no. MSRR-47
Contract Nonr76024 Proj. NR-047-048
Unclassified report

Prepared in cooperation with Northwestern Univ., Evanston, Ill, Contract Nonr122810, Proj. NR-047-021.

Descriptors: (*Research program administration, Costs), (*Management control systems, Real time), Decision making, Optimization, Budgets, Functions, Analysis of variance, Management engineering

Funding of research projects is considered as encompassing three stages: (1) an initial short-run plan for funding based upon projected regular demands and availability subject to random deviations; (2) adjustment of the initial plan to take into account the actual regular demands and the availability and the funding of significant breakthroughs which occur at random intervals, preempting other demands; and (3) a plan for longer-run availability and demands which constitute a 'posture' desired subsequent to the funding adjustments of (2). The essence of the distribution of the unexpected demands is multi-modality with low probability of occurrence but high resource demand when they do occur. This approach represents a substantial departure from the usual planning model development which produces only an optimal plan based on forecasted developments without provision for adjustment when the forecasted events actually materialize and additional unexpected demands are placed on resources. The adjustment process explored here--which provides the mechanism for optimal implementation of the original plan or control of resource allocation--enables optimal response to information received in 'real-time,' avoiding the frequently observed over- or under-response to receipt of such information without reference to the impact of the interim decision on future capabilities. (Author)

AD-620 348 **See Fld. 5/4**

AD-620 350 **See Fld. 5/9**

AD-620 376 **See Fld. 5/9**

AD-620 406 **See Fld. 1/5**

AD-620 429 **See Fld. 5/9**

AD-620 433 **See Fld. 1/5**

AD-620 662 **See Fld. 15/7**

5/2. DOCUMENTATION AND INFORMATION TECHNOLOGY

AD-620 331 **See Fld. 15/3**

AD-620 342 Div. 32/3 ,28/1
CFSTI Prices: HC $4.00 MF $0.75
GEORGIA INST OF TECH ATLANTA
EXPERIMENTAL DESIGN FOR MEASURING THE INTRA- AND INTER-GROUP CONSISTENCY OF HUMAN JUDGMENT OF RELEVANCE.
Master's thesis,
by John Marion Hoffman. 0 Aug 65, 122p. Contract AF33 608 1063
Unclassified report

Descriptors: (*Subject indexing, Reasoning), (*Reasoning, Subject indexing), Design, Scientific research, Analysis, Statistical analysis, Reports

The suspected variability of humans in judging the relevance of documents is one of the current problems confronting the development and improvement of document information and retrieval systems. The purpose of this thesis was to design a method to investigate the variation of relevance judgments between two groups of analysts and among the analysts within each group. A pilot experiment was conducted using two groups of analysts (subject experts and non-experts) and two question-document collections (machine retrieved and randomly selected). Analysts were instructed to mark each document relevant or not-relevant to the given question and to record the time required to make such relevance assessments. The responses were analyzed statistically. The data permitted the following conclusions: (1) the analysts within the groups could consistently agree on the relevance of documents to questions; (2) the degree of consistency of the two groups did not differ significantly; (3) the two groups did agree on the relevance of a particular document to a question; and (4) the method of document selection had a serious effect only on the consistency of the group of non-experts.

AD-620 360 Div. 32/3
CFSTI Prices: HC $4.00 MF $0.75
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
AFOSR/SDC PROCEEDINGS OF THE WORKSHOP ON WORKING WITH SEMI-AUTOMATIC DOCUMENTATION SYSTEMS, AIRLIE FOUNDATION-WARRENTON, VIRGINIA, MAY 2-5, 1965,
by J. J. Maher. 01965, 109p. Contract AF19 628 3418
AFOSR , 65-1699
Unclassified report

Descriptors: (*Documentation, Automatic), Symposia, Information retrieval, Air Force, Libraries, Programming (Computers), Subject indexing, Classification, Abstracting, Vocabulary, Indexes, Management planning, Automation

Contents: Introduction, by Raymond P. Barrett; Summary, by Harold Wooster; Keynote address, by William T. Knox. PRESENTATIONS: CIRC--Centralized Information Reference and Control, by Raymond P. Barrett: An operating system: The IBM Technical Information Retrieval Center, by C. Allen Merritt; and Historical development and present status: Douglas Aircraft Company computerized library programs, by Aubrey S. Williams. SUMMARIES OF PANEL DISCUSSIONS: Indexing and Classification, by Bernard K. Davis;

Abstracting and extracting, by Herbert Rehbock; Vocabulary construction and control, by William B. Hammond; Input processing, by Y. S. Touloukian; Request processing, by William A. Barden; Announcement and dissemination, by Van A. Wente; User-system relationships, by Fred H. Wise; and System parameters and management, by James W. Singleton.

AD-620 420 Div. 32/3
CFSTI Prices: HC $3.00 MF $0.75
PITTSBURGH UNIV PA
A COMPARISON OF KEYWORD-IN-CONTEXT (KWIC) INDEXING TO MANUAL INDEXING.
Master's thesis,
by Richard Lee Binford. 01965, 77p. Contract AF33 608 1104

Unclassified report

Descriptors: (*Subject indexing, Effectiveness), Information retrieval, Probability, Indexes, Statistical analysis

The Knowledge Availability Systems Center at the Univ. of Pittsburg evaluated, by three different methods, the effectiveness of an information retrieval system indexed by 2 different methods. The sample for the evaluation was from questions submitted to a 'Spin-off project' of the National Aeronautics and Space Agency on providing a facility to disseminate NASA-sponsored research into the local area economy. The first evaluation was based on percentages of correct retrievals and correct rejections. The KWIC and manually indexed systems were 56.39 and 68.91% effective, respectively. The second evaluation was based on conditioned probabilities; KWIC was even less effective when documents retrieved and not retrieved were looked at, however KWIC exhibited a 0.938 probability that documents not pertinent to the question would be retrieved. By allowance of a little more noise, KWIC could become a more effective indexing technique. The third evaluation on a document-bydocument analysis basis provided results similar to those of the second method. Although KWIC is not regarded as very effective for retrieving pertinent information. There is little doubt that it can be effective in very specialized situations.

AD-620 653 **See Fld. 9/3**

AD-620 657 Div. 32/3 ,32/11,30/2
CFSTI Prices: HC $1.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
A NECESSARY AND SUFFICIENT CONDITION FOR A CONTEXT-FREE GRAMMAR TO BE UNAMBIGUOUS,
by Val Schorre. 28 Jul 65, 19p. Rept. no. SP-2153

Unclassified report

Descriptors: (*Programming languages, Language), (*Language, Mathematical analysis), Compilers, Character recognition, Algebras

A class of context-free grammers called first-character-recognition grammars (or fcr grammars) is defined. These grammars obviously satisfy the necessary and sufficient condition; consequently, they are unambiguous. It is shown to be a decidable question, whether a given grammar is an fcr grammar. Many programming languages can be described by fcr grammar. Many programming languages can be described by fcr grammars; ALGOL can be so described, except for the distinction between arithmetic and Boolean expressions. (Author)

5/3. ECONOMICS

AD-620 172 **See Fld. 5/1**

AD-620 389 Div. 32/4 ,15/2
CFSTI Prices: HC $2.00 MF $0.50
OKLAHOMA UNIV NORMAN
HUERISTIC APPLICATIONS OF QUEUEING TECHNIQUES AS RELATED TO BANK DRIVE-IN SERVICE WINDOWS.
Master's thesis,
by Alexander Young Bishop. 01965, 44p. Contract AF33 608 1096

Unclassified report

Descriptors: (*Queueing theory, Banking), (*Banking, Queueing theory), Operations research, Probability, Statistical tests, Commerce

It is the purpose of this study to outline a more efficient queue discipline to replace the system currently in use by the bank. So, in summary, it is pointed out that the bank is remodeling the parking lots and in doing so, will change the entry point for the drive-in service windows. This change in the point of entry will allow the adoption of a new queue discipline. Instead of allowing a queue to form at each window, the new discipline will serve all service channels from a common queue.

AD-620 405 **See Fld. 13/6**

AD-620 676 Div. 32/4 ,15/1
CFSTI Prices: HC $2.00 MF $0.50
CALIFORNIA UNIV BERKELEY CENTER FOR RESEARCH IN MANAGEMENT SCIENCE
COMPETITIVE EQUILIBRIUM UNDER UNCERTAINTY.
Technical rept.,
by RoyRadner. 0 Aug 65, 46p. Rept. no. TR-20 Contract Nonr22277 Proj. NR047 029 Task RR003 07 01

Unclassified report

Descriptors: (*Commerce, Probability), (*Economics, Probability), (*Decision making, Economics), Theory, Decision theory, Communication theory, Game theory, Mathematical models

The paper represents an application of the modern theory of competitive equilibrium to the case of uncertainty. Two theorems are presented: the first sets forth sufficient conditions for the existence of a competitive equilibrium for the case in which each economic agent has a given structure of information available and the second sets forth sufficient conditions for the existence of a competitive equilibrium for the case in which any available structure of information may be used. However, if the costs of obtaining information are included in the analysis, the conditions of the theorem may not be met. This is also true if the costs necessary to perform computations are included. In addition if part of the information available to economic agents concerns the behavior of other agents rather than concerning environmental variables, the conditions of the theorem may not be fulfilled. (Author)

5/4. HISTORY, LAW AND POLITICAL SCIENCE

AD-620 345 Div. 32/5 ,32/8
CFSTI Prices: HC $3.00 MF $0.75
STANFORD UNIV CALIF
THE LITERARY TREATMENT OF A NATION'S DOWNFALL: FONTANE'S DEPICTION OF PRE-JENA PRUSSIA.
Master's thesis,
by William Terry Wilson. 0 Aug 65, 77p. Contract AF33 608 1114

Unclassified report

Descriptors: (*West Germany, History), (*East Germany, History), Sociology

The condition of society in Prussia during the Napoleonic era prior to the 1806 Battle of Jena is reviewed as it is depicted in the novel of Theodor Fontane that appeared in 1883, 'Schach von Wuthenow. In that novel, Fontane is credited with exposing Prussian aristocracy along with portraying accurately the downfall of Prussia.

AD-620 347 **See Fld. 1/5**

AD-620 348 Div. 32/8 ,18/5 ,26/2
CFSTI Prices: HC $6.00 MF $1.25
BOSTON UNIV MASS SCHOOL OF PUBLIC COMMUNICATION
THE GENERAL OR ADMIRAL OF MILITARY SERVICE: AN ANALYSIS OF HIS ROLE AS A PUBLIC OPINION LEADER--CIVIL-MILITARY RELATIONS.
Master's thesis,
by Frank J. Morris. 0 Aug 65, 235p. Contract AF33 608 1042

Unclassified report

Descriptors: (*Officer personnel, Public relations), (*Public opinion, Officer personnel), History, United States Government, Political science, Military phychology, France, Great Britain, USSR, West Germany, East Germany

The thesis is a study on the proper role that our generals and admirals should fill as military public opinion leaders. The study reveals a role which is compatible with our democratic principles establishing a proper accord and balance between the responsibilities and authority of our political and military leaders during the present 'protracted conflict.' The military public opinion leader role fosters the right for freedom of expression, the need for a knowledgeable citizenry, and preserves the principle of civil supremacy over the military. The limitations to the scope of the role are set by our democratic principles and by the limitations as defined by national security in our national interest. Their role fits our contemporary needs and has been established by evaluating the mistakes of civil-military affairs in our history as well as the histories of Prussia-Germany, Japan, Great Britain, Russia, and France. In this analysis tradition was found to serve and foster conformity and was used as a justification for the continuance of present malpractices. Preconceptions and stereotyped beliefs, opinions, and attitudes have clouded the judgment of our political and military leaders as well as our citizenry in political-military affairs. The study shows that we have neither learned nor appreciated the lessons history reveals.

AD-620 430 Div. 32/8 ,32/5
CFSTI Prices: HC $6.00 MF $1.25
MICHIGAN STATE UNIV EAST LANSING
A STUDY OF HISTORICAL PERCEPTIONS CONCERNING ALLEGATIONS OF SUBVERSIVE INFLUENCE ON THE FAR EASTERN POLICY OF THE UNITED STATES PRIOR TO 1949.
Master's thesis,
by George Newland. 01965, 221p. Contract AF33 608 1085

Unclassified report

Descriptors: (*Foreign policy, United States Government), (*China, History), Communists, Far East, Political science

A study is made of 3 diplomatic representatives who were accused of disloyalty in the conduct of a U.S. foreign affairs in connection with the fall of China to the Communists. The men are John Stewart Service, John Carter Vincent and John Paton Davies. The data were derived largely from Congressional hearings and reports, supplemented by selected secondary sources. An effort is made to study the backgrounds of the men, the allegations made against them, the evidence for and against them, and the ultimate disposition of their personnel security cases. The men were accused of having betrayed American interests out of Communist sympathies. The basic hypothesis of the research is that the men performed, or attempted to perform their duties, or otherwise acted, so as to serve the interests of another government in preference to the interests of the U.S. The hypothesis is judged not to have been proven.

AD-620 647 Div. 32/8
CFSTI Prices: HC $2.00 MF $0.50

RAND CORP SANTA MONICA CALIF
SOVIET MILITARY POLICY UNDER KHRUSHCHEV'S SUCCESSORS,
by Thomas W. Wolfe. 0 Aug 65, 35p. Rept. no. P-3193

Unclassified report

Descriptors: (*Foreign policy, USSR), Political science, Government (Foreign), Leadership, National defense, Armed forces (Foreign), Military strategy, Communists

AD-620 648 Div. 32/8
CFSTI Prices: HC $3.00 MF $0.75
RAND CORP SANTA MONICA CALIF
THE SOVIET UNION AND THE SINO-SOVIET DISPUTE,
by Thomas W. Wolfe. 0 Aug 65, 65p. Rept. no. P-3203

Unclassified report

Presented by the author on Mar 11, 1965, to the Subcommittee on the Far East and the Pacific Committee on Foreign Affairs, House of Representatives, Washington, D. C.

Descriptors: (*USSR, Foreign policy), (*China, Foreign policy), Political science, Leadership, Government (Foreign), Nuclear warfare, Limited war, Southeast Asia, Communists

AD-620 666 Div. 32/8 ,32/5 ,15/1
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP SANTA MONICA CALIF
AN ANALYTIC MODEL OF POLITICAL ALLEGIANCE AND ITS APPLICATION TO THE CUBAN REVOLUTION,
by John L. Enos. 0 Aug 65, 35p. Rept. no. P-3197

Unclassified report

Descriptors: (*Political science, Mathematical models), (*Cuba, History), Mathematical analysis, Operations research, Partial differential equations

A model is developed whose successive solutions are to reveal changes in political environment; the elements of the model are participants in political affairs and the 'interest' or 'pressure' groups to which they belong and through whose collective agency they act. The model is arranged into 2 interest groups, each of which will be assumed to have individuals falling into one of 3 categories: (1) the loyalists who have joined a group but who give it no more than their sympathy, (2) the activists who have joined a group and are active in securing its aims, and (3) those committed members whose fortunes are so closely interwoven with those of a group that their adherence is irrevocable. The model is based on terms from the physical world, specifically on that of chemical solution that is made up of different materials dissolved in one another; the total free energy (see AD-605 919) is the characteristic on which the model is focused. The 2-group, 3-component model is illustrated by application to the Cuban revolution of 1956-1958. Tables are given of the distribution of followers and opponents of the Cuban regime in 1953 (observed) and 1956 (calculated). (Author)

5/6. HUMANITIES

AD-620 419 Div. 32/13
CFSTI Prices: HC $3.00 MF $0.75
CATHOLIC UNIV OF AMERICA WASHINGTON D C
THE RELATIONSHIP OF THE APOSTOLIC KERYGMA TO THE HOMILY.
Master's thesis,
by Robert T. Mc Manus. 0 Jun 65, 73p. Contract AF33 608 1050

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Religion, Analysis), Education

The sermon of St. Peter, as recorded in Acts 2:14-40, is regarded as an instance of the kerygma or apostolic proclamation. It is the first recorded sermon by the Prince of the Apostles who preached immediately after the reception of the Holy Spirit. The kerygma was addressed to a nonChristian audience to bring to its members the good news of salvation in Christ Jesus. The homily 'is the communication of the word based on the Word of God in the scriptures, spoken within the context of the sacred liturgy, and directed to the building up of the faith and sanctification of God's people in the Church'. Kerygma seeks to initiate Faith among nonChristians, while the homily addresses itself to those already possessing the Faith. The purpose of this thesis is not to equate these two forms of Christain preaching but 'to seek out those features in the kerygma which can, and perhaps should, influence homiletic preaching because of a kinship to the apostolic message.'

5/7. LINGUISTICS

AD-620 605 Div. 32/11
CFSTI Prices: HC $4.00 MF $0.75
COLUMBIA UNIV NEW YORK
JOSEPH DENNIE: A CAVALIER AT WORK IN AMERICAN LITERATURE.
Master's thesis,
by Edward A. Linn. 0 Dec 57, 109p.

Unclassified report

Descriptors: (*Culture, United States), (*United States, Culture)

Joseph Dennie was an American critic and essayist who founded the 'Port Folio', America's first successful literary journal, thereby setting the standards of literary taste for the first decade of the 19th century. Dennie's Stuart Cavalier conservatism caused him to attack Jefferson and Franklin. Jefferson he attacked for championing democracy, a form of government that he claimed awarded the unlearned masses an equal place with gentlemen scholars in the determination of literary standards. Franklin he held responsible for a sordid economy in government that denied lucrative offices and outright grants to deserving artists. Dennie described America as 'a land where genius sickens and where fancy dies.' Dennie's neglect as a critic is said to be just: he failed to adjust to America's change to a democracy because he was certain that a democracy could not support polite letters and because his love for classic literature was genuine.

AD-620 657 See Fld. 5/2

5/9. PERSONNEL SELECTION, TRAINING AND EVALUATION

AD-620 201 Div. 23/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
THE DEVELOPMENT OF CRITERION GROUPS OF 'GOOD' AND 'POOR' FLIGHT INSTRUCTORS BASED ON STUDENT RATINGS.
Research rept.,
by Richard Trumbull, and W. E. Vinacke. 20 Nov 45, 17p. Rept. no. RR-2
Proj. X673Av355a

Unclassified report

Descriptors: (*Naval training, Aviation personnel), (*Instructors, Aviation personnel), Selection, Attitudes, Measurement

Student evaluations of their flight instructors, obtained on a sample of 112 men in Intermediate Training Squadron 3, NATB, Pensacola, were used to establish criterion groups for analysis of selection data. Agreement among six criteria of success was determined, and the 20% 'best' and 20% 'worst' instructors isolated in these terms. Conclusions: (1) Six criteria derived from student evaluations can be used to assess the success of flight instructors; (2) The six criteria show close agreement; (3) Using a composite of these six criteria, extreme and highly differentiated groups of 'good' and 'poor' flight instructors can be defined. (Author)

AD-620 272 Div. 23/1 ,28/4
CFSTI Prices: HC $2.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
THE ASSESSMENT OF OFFICER-LIKE QUALITIES IN NAVAL AIR CADETS.
Research rept.,
by W. E. Vinacke. 29 Oct 56, 36p. Proj. NM001 109 101
NAVMED , NM-001-109-101-6

Unclassified report

Descriptors: (*Naval personnel, Leadership), (*Officer personnel, Psychometrics), Selection, Personality, Military training, Behavior

The report presents a 'test case' for the validity of the officer-like qualities rating, together with analyses of the validity of other measures of 'nontechnical' aspects of training. These include peer nominations, cadet officership, and records of delinquency and demerits. Certain internal properties of the OLQ rating are examined, especially the incidence of substandard checks. The criterion of validity was judgment of acceptability as an officer made by senior officers in the fleet. In general, evidence reveals that satisfactory men differ from unsatisfactory men throughout training. Available measures possess sufficient validity for prediction purposes. It is suggested that officerlikeness involves traits of military behavior, leadership, acceptability as a person, and devotion to duty. Proposals to improve the measurement of officerlikeness are considered. (Author)

AD-620 304 Div. 23/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
LISTENING TRAINING AIDS FOR PRE-FLIGHT AND PRIMARY FLIGHT STUDENTS.
Research rept.,
by M. D. Steer, and J. M. Hadley. 22 Sep 45, 25p. Proj. X520Av274h
NAVMED , X-520 (Av-274-h)-1

Unclassified report

Descriptors: (*Aviation personnel, Training devices), (*Training devices, Disk recording systems), Naval training, Flight, Students, Tests, Graphics

A series of four listening training recordings (thirty minutes each) was prepared from a sample of twenty-five hours of Primary flight instruction recorded during flight. These recordings were designed for use immediately prior to flight training. Two groups of Primary flight students at NAS, Ottumwa were used in the evaluation of the listening training recordings. Approximately half of the students in each group received training and the other half did not. All groups were given a pre-test and a post-test. Opinions pertinent to this training were collected and reported. (Author)

AD-620 305 See Fld. 5/10

AD-620 319 See Fld. 6/16

AD-620 320 Div. 23/1 ,28/4
CFSTI Prices: HC $1.00 MF $0.50
NAVAL PERSONNEL RESEARCH ACTIVITY SAN DIEGO CALIF
A COMPARISON OF RESPONSES TO A VOCATIONAL INTEREST TEST TAKEN UNDER STANDARD CONDITIONS AT RECRUITING STATIONS AND RESPONSES TO THE SAME TEST TAKEN AS A SELF-ADMINISTERED TEST AT HOME.
Interim rept. for Dec 63-Oct 64 (Research memo),
by Richard R. Stephenson, Lou Hicks Smith, and Bernard Rimland. 0 May 65, 9p. Rept. no. SRM-65-3

Proj. 3 1607 01 01S2

Unclassified report

Descriptors: (*Recruiting, Psychometrics), (*Psychometrics, Analysis), Military personnel, Correlation techniques

The Strong Vocational Interest Blank (SVIB) was administered experimentally to all applicants for the 1964 NROTC (Regular) program. For a variety of administrative reasons, none systematically biasing, 213 of these applicants took the SVIB at home as a self-administered test. This group was matched with a group tested under standard conditions at Recruiting Stations. Comparison of responses revealed no differences which were not explainable as random sampling fluctuations. Since the experimental nature of the testing was not revealed to the applicants, these findings indicate that vocational interest tests may be taken at home as part of an operational selection battery. Such tests, mailed to the applicant and returned by mail prior to the applicant's reporting date, could be scored and interpreted for use at the time of the applicant's initial processing and interviewing. (Author)

AD-620 326 See Fld. 6/16

AD-620 349 Div. 23/1
CFSTI Prices: HC $4.00 MF $1.00
BOSTON UNIV MASS SCHOOL OF PUBLIC COMMUNICATION
THE MILITARY OFFICER AS PORTRAYED BY SELECTED CLASS PERIODICALS AND MASS CIRCULATION MAGAZINES FROM 1960-1965.
Master's thesis,
by Gerald C. Baumer. 0 Aug 65, 135p. Contract AF33 608 1042

Unclassified report

Descriptors: (*Officer personnel, Public relations), (*Periodicals, Officer personnel), United States Government, Leadership, National defense, Education

Findings suggest that the media tend to bring certain predispositions to bear which influence the content and context of the coverage. Certain crucial issues remain actively influential long after the occurrence of events which sparked them. Together with other issues and events they form 'sets of prevailing conditions' which in turn influence the coverage of other events related to the subject. Concentration is almost exclusively on the highest levels of military leadership, with the senior leaders bearing the brunt of critical commentary. Actions at the highest levels often were unclear in terms of responsibility. Top level leaders and controversial figures received the most attention with the vast majority of military leaders being overlooked. However, several scholars report that a new officer corps is coming about--one made up of military intellectuals who are rising because of their technical and managerial expertise. Topics outside the crucial issues resulted in a broader portrayal of the military officer, though it was lacking and was usually overshadowed by the larger issues. Generally it was found that accuracy and objectivity were not consistent among the media studied.

AD-620 350 Div. 23/1 ,18/5 ,26/2
CFSTI Prices: HC $5.00 MF $1.00
BOSTON UNIV MASS SCHOOL OF PUBLIC COMMUNICATION
A STUDY OF ROLE CONFLICT AFFECTING PUBLIC INFORMATION WORK IN THE UNITED STATES AIR FORCE: TWO ADMINISTRATIVE LEVELS: BASE/WING AND MAJOR AIR COMMAND.
Master's thesis,
by Gerald M. Holland. 01965, 153p. Contract AF33 608 1042

Unclassified report

Descriptors: (*Air force, Public relations), (*Officer personnel, Air force personnel), United States Government, Education, Military personnel

The thesis is an attempt to examine the depth of pressures and elements of 2 structures that can produce conflict for an Air Force Public Information Officer. It examines the bureaucratic structure within which he works as one conflict source and the structure of the news gathering facility as another source of pressure and conflict. The essential fact revealed is that opinions, attitudes and acceptance of the PIO function in and out of the military are created and maintained in association with others. A change in ideas cannot be purely an individual matter nor does it follow that acceptance of either a person or his work is mandatory because of the person's status, position or role in the structure. The key fact is that the PIO and newsman are members of different groups and that membership pressures both parties toward conformity of the group norms. It is this concept that overrides the individualism of each and recognition of this fact of life forms the foundation for an approach to the reduction of role conflict.

AD-620 375 Div. 23/5 ,16/1 ,28/4
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
THE RELATIONSHIP BETWEEN PAST HISTORY OF MOTION SICKNESS AND ATTRITION FROM FLIGHT TRAINING.
Research rept.,
by Charles W. Hutchins,Jr., and Robert S. Kennedy. 14 Jun 65, 11p. Rept. no. NSAM-932 NAVMED , MR005.13-3003.10-8

Unclassified report

Descriptors: (*Aviation personnel, Selection), (*Motion sickness, Aviation personnel), Naval personnel, Flight, Performance (Human), Psychometrics, Stress (Physiology), Statistical analysis, Military training

The Pensacola Motion Sickness Questionnaire (MSQ) was subjected to an item analysis using successful completion of the flight training program as the criterion for item selection. The scoring key that resulted was cross-validated on a new sample and a statistically significant correlation obtained. When included in the multiple prediction formulae used at this facility to predict training success, the MSQ made significant increases in the multiple validity of the formulae for predicting both successful completion of flight training and voluntary withdrawal from training. (Author)

AD-620 376 Div. 23/1 ,23/2 ,30/1
CFSTI Prices: HC $6.00 MF $1.25
STANFORD RESEARCH INST MENLO PARK CALIF
WORK ACTIVITIES AND ATTITUDES OF SCIENTISTS AND RESEARCH MANAGERS: DATA FROM A NATIONAL SURVEY.
Interim technical rept., phase 3, on R and D Studies Series,
by Howard M. Vollmer. 0 May 65, 223p. Contract AF49 638 1028 Proj. 9779 ,SRI 1M3580 Task 977901
AFOSR , 65-0781

Unclassified report

See also AD-609 356.

Descriptors: (*Scientific personnel, Attitudes), (*Management engineering, Scientific personnel), Behavior, Employee relations, Research program administration, Professional personnel, Industrial relations, Data

This report constitutes a basic data source on the organizational relations, activities, and attitudes of scientists and research managers in a variety of contexts throughout the United States. The data were obtained from a national survey of scientists and research managers in four disciplines--biology, chemistry, mathematics, and physics--using random samples of members of professional associations, and are broken down by five major variables: professional affiliation, type of employer, geographic region, educational level, and age. This is a descriptive report and largely consists of a tubular presentation of data accompanied by brief textual summaries of outstanding findings. As presented, the data are susceptible to further analysis and interpretation according to specific interests of the reader. Illustrative of the results are the following: In contexts where basic research goals are most likely to be emphasized (in universities, in many nonprofit research organizations, in some government agencies and departments, and in certain types of industries) research activities are most often organized in a unit or department separate from development activities. In contrast, where applied research goals are most emphasized research and development are more often encompassed within the same organizational unit. (Author)

AD-620 408 See Fld. 15/7

AD-620 408 See Fld. 15/7

AD-620 429 Div. 23/1 ,26/2
CFSTI Prices: HC $5.00 MF $1.00
MICHIGAN STATE UNIV EAST LANSING
ADMINISTRATION OF INVESTIGATIVE ACTIVITIES. A STUDY OF FACTORS RELATING TO CONTROL OF INVESTIGATORS.
Master's thesis,
by John H. Faughn. 01965, 171p. Contract AF33 608 1085

Unclassified report

Descriptors: (*Personnel management, Police), (*Police, Personnel management), Supervision personnel, Personnel, Selection, Motivation

The study investigates factors relating to control of investigative personnel. The nature of investigative duties requires a considerable degree of both freedom of discretion and judgment on the part of the investigator. Much of his work is performed away from the office and out of sight of superiors. Contacts, out of necessity, are maintained with criminal elements. Both temptation and opportunities for crime are often presented. It is hypothesized that in view of the unique nature of investigative duties the most effective control will be achieved in an environment which emphasizes a positive approach to motivation of personnel. In this concept the goals of the individual and those of the organization are integrated into an over-all common objective. Control of investigators in this sense is not merely concerned with the restrictive aspect of control, that is, to keep an investigator from defecting or corruption, but with achieving from the investigator outstanding results.

AD-620 602 Div. 23/4 ,30/2
CFSTI Prices: HC $2.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
EXPLORATIONS IN COMPUTER-ASSISTED COUNSELING.
Technical memo.,
by John F. Cogswell, and Donald P. Estavan. 6 Aug 65, 29p. Rept. no. TM-2582/000/00 Contract 7 14 9120 217

Unclassified report

Descriptors: (*Education, Data processing systems), (*Data processing systems, Education), Computers, Simulation, Teletype systems, Programming (Computers), Scheduling, Decision making, Behavior

Explicit models of a school counselor's cognitive behavior in the appraisal of student information and of his overt verbal responses in the educational planning interview were made with computer programs and computercontrolled equipment. The computer system was based on recordings of the counselor's verbalizations in two situations--as he thought aloud while analyzing the student cumulative records prior to interviews, and as he conversed with the student during the interview. The sample consisted of 20 ninth-grade students. A program on the Philco 2000 computer, representing the preinterview appraisal, accepts inputs such as school grades, test scores, and biogra-

phical data; analyzes the data according to the inferred model of the counselor's decision-making rules; and prints out statements such as 'Student's grades have gone down quite a bit. Ask about this in interview. Possibly there are personal problems,' or 'Low counseling priority; no problems apparent.' The automated interview is conducted by a teletype under control of the Q-32 computer in a time-sharing mode. This automated interview program reviews student progress, collects comments from the student, reacts to student plans, and helps the student plan a schedule of high school courses. To assess the validity of the model, the automated systems were compared to the responses of the original human counselor with a new sample of 20 students from the same population. (Author)

AD-620 606 See Fld. 5/10

AD-620 627 Div. 23/1 ,28/5
SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TEX
PERSONAL HABITS AMONG USAF AIRCREW MEMBERS: A SURVEY,
by Jefferson C. Davis, and David H. Beyer.
01965, 4p.
Unclassified report

Pub. in Aerospace Medicine v36 n4 p357-60 Apr 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Air force personnel, Behavior), (*Aviation medicine, Air force personnel), Medical examination, Alcohols, Drugs, Diet

A questionnaire survey was conducted among 1,960 USAF aircrew members, one-half anonymous and one-half non-anonymous, in which each man recorded his drug, alcohol and tobacco consumption and diet for one 24-hour period. 1,087 responses were obtained (55.5 per cent). No significant differences were found between the anonymous and non-anonymous groups. Only nine men (one per cent) took non-acceptable self-medication while on flying status and of these only one man took the drug (a motion sickness preparation) on a day when he performed flying duty. 51.5 per cent of the men are cigaret smokers and an additional 10.3 percent smoke pipes or cigars only. 16.8 per cent of the 125 pilots flying on the day of the questionnaire ate no breakfast. (Author)

AD-620 662 See Fld. 15/7

AD-620 663 Div. 23/4 ,30/2
CFSTI Prices: HC $5.00 MF $1.00
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
THE VALIDATION OF AN AUTOMATED COUNSELING SYSTEM,
Technical memo.,
by Deloss David Friesen. 20 Aug 65, 196p.
Rept. no. TM-2611/000/00
Unclassified report

Descriptors: (*Education, Data processing systems), (*Data processing systems, Education), Students, Computers, Simulation, Behavior, Programming (Computers), Decision making, Scheduling

The report describes experiments concerned with the validity of an Automated Counceling System. Forty 9thgrade students from the Palo Alto School District participated in the validation study. The cumulative records of the 40 students were analyzed by the automated appraisal program and the 40 students participated in the automated educational planning interview. Twenty of the 40 students also were interviewed by the original counselor whose behavior was being simulated by the automated program. The other 20 students were interviewed by a second counselor from the school district. Both counselors made appraisals of the students from the student cumulative record. The performance of the automated counseling system was compared to the performance of the two counselors on the following four variables: the appraisal of pupil records prior to the interview, the post-interview appraisal of students, the educational decisions made by the students, and the completeness of students' educational plan. This is Dr. Friesen's doctoral dissertation. (Author)

AD-620 668 Div. 23/1 ,28/4
CFSTI Prices: HC $2.00 MF $0.50
NAVAL PERSONNEL RESEARCH ACTIVITY SAN DIEGO CALIF
INVESTIGATION OF THE UNITED STATES NAVY CLERICAL APTITUDE TEST, FORM 6,
Final rept.,
by Ervin W. Curtis. 0 Aug 65, 34p. Rept. no. STB-66-7
Proj. 3 1605 01 01S2
Unclassified report

Descriptors: (*Aptitude tests, Naval personnel), (*Naval personnel, Selection), Test construction (Psychology), Correlation techniques, Statistical analysis, Tables

An investigation of the content, format, and validity of the United States Navy Clerical Aptitude Test, Form 6 was undertaken. The data of a previous investigation were analyzed in order to see if the statistical assumptions underlying the data analyses were satisfied, to determine the effect of waivers (selectees whose selection test scores were below th operational cutoff) upon the validity coefficients, and to determine how well CLER would predict broad categories of final grade. It was concluded that previous analyses gave a true indication that CLER aids significantly, but only slightly, in selecting recruits for these schools. Various ways of improving CLER and its utilization were considered. Several aspects of the format of CLER were criticized. The investigation was extended to the search for a clerical aptitude test that would be more valuable to the Navy than CLER. Eleven short clerical aptitude tests were administered to successive classes in seven A-Schools. Scores on several of these tests were more highly correlated with final grade than was CLER. These tests also augmented the correlations of GCT and ARI with final grade more than did CLER. The principle recommendations were: (1) Replacement of CLER by its short form (United States Navy Clerical Aptitude Test, Form SB-1) until a better test can be put into operation. (2) Construction of a test similar to the Coding Test of the U. S. Army Clerical Speed Test, followed by research to determine the advisability of replacing CLER with a Navy version of that test. (Author)

AD-620 674 Div. 23/1
CFSTI Prices: HC $3.00 MF $0.75
NAVAL PERSONNEL RESEARCH ACTIVITY SAN DIEGO CALIF
ANALYSIS OF NAVY ENLISTED PERSONNEL RETENTION VARIABLES.
Research rept.,
by Bradley B. Nickey, and R. V. May Jr.. 0 Aug 65, 77p. Rept. no. SRR-66-1
Proj. PF016080101
Unclassified report

Descriptors: (*Naval personnel, Recruiting), (*Personnel management, Selection), Analysis of variance, Job analysis, Psychometrics, Correlation techniques

The report presents the results of a partial analysis of the responses of a Navy-wide questionnaire survey of over 5,000 enlisted personnel. Fifty-nine out of 85 items in the questionnaires were found to be significantly related to retention. Bar charts are presented showing the precentage of reenlistment of personnel who selected the various alternative answers in each of these 59 items. (Author)

AD-620 721 Div. 23/1 ,33/1 ,28/4
CIVIL AEROMEDICAL RESEARCH INST OKLAHOMA CITY OKLA
PROBLEMS IN AIR TRAFFIC MANAGEMENT: VI. INTERACTION OF TRAINING-ENTRY AGE WITH INTELLECTUAL AND PERSONALITY CHARACTERISTICS OF AIR TRAFFIC CONTROL SPECIALISTS,
by David K. Trites. 0 Jul 65, 14p. Contract FA AC4 730
AM-, 65-21
Unclassified report

Pub. in Aerospace Medicine v35 n12 p1184-94 Dec 1964 (Copies not available to DDC or Clearinghouse customers). Available from CFSTI as PB-168 322, HC$1.00, MF$0.50.

Descriptors: (*Air traffic, Management planning), (*Air traffic controllers, Psychometrics), Aging (Physiology), Aptitude tests, Personality, Students, Education, Intelligence tests, Memory, Performance tests, Word association

Over 900 Enroute and Terminal Air Traffic Controller Specialist (ATCS) trainees were administered a large number of aptitude and personality tests. Examination of the relationships between the performance scores and age at entry into training revealed that: (1) older trainees had lower test scores than the younger trainees on tests of immediate memory and nonverbal abstract reasoning; (2) older trainees had higher test scores than younger trainees on tests of arithmetic and verbal ability; (3) in highly speeded aptitude tests, the type of test (e.g., arithmetic, spatial, vocabulary, etc.) apparently determined whether the older or younger trainees would have the higher scores; and (4) in the personality area, older trainees were more intellectually efficient, responsible, tolerant, etc., than their younger classmates. It was concluded that the higher failure rate in the training of older individuals could be partially accounted for by age-related deficiencies in non-verbal abstract reasoning, by immediate memory for new and different material, and by the requirements to perform their job tasks rapidly and accurately. (Author)

AD-620 722 Div. 23/1 ,33/1 ,28/4
CIVIL AEROMEDICAL RESEARCH INST OKLAHOMA CITY OKLA
PROBLEMS IN AIR TRAFFIC MANAGEMENT: V. IDENTIFICATION AND POTENTIAL OF APTITUDE TEST MEASURES FOR SELECTION OF TOWER AIR TRAFFIC CONTROLLER TRAINEES,
by Bart B. Cobb. 0 Jul 65, 11p.
AM-, 65-19
Unclassified report

Pub. in Aerospace Medicine v35 n11 p1020-7 Nov 1964 (Copies not available to DDC or Clearinghouse customers). Available from CFSTI as PB-168 331, HC$1.00, MF$0.50.

Descriptors: (*Air traffic, Management planning), (*Air traffic controllers, Selection), Training, Effectiveness, Aptitude tests, Reasoning, Word association, Personality, Students

A study of over 200 Terminal Air Traffic Control Specialists indicated that their training performance could be well predicted by a composite of four aptitude tests measuring: numerical ability, non-verbal abstract reasoning, ability to solve simplified air traffic problems, and verbal abstract reasoning. Pre-employment experience directly related to air traffic control was also found to contribute to the prediction of training performance. Although the aptitude tests were related in the expected direction with a measure of job performance, the relationships were small. The aptitude of verbal abstract reasoning is both unique and important for the prediction of Terminal ATCS performance. Previous research has failed to identify such an aptitude as being of importance for the prediction of Enroute ATCS performance. With the exception of verbal abstract reasoning, the group of Civil Service Commission tests presently being used to select all ATCS trainees provides adequate measures of those aptitudes which this study identified as most significant for the prediction of Terminal performance and is still appropriate for selection of Terminal and Enroute ATCS

trainees. (Author)

5/10. PSYCHOLOGY (INDIVIDUAL AND GROUP BEHAVIOR)

AD-620 145 Div. 28/5 ,28/4
CFSTI Prices: HC $2.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
ASPECTS OF THE AUTONOMOUS PERSONALITY: VII. THE PENSACOLA Z SURVEY.
Research rept.,
by Marshall B. Jones. 15 Oct 56, 34p.
NAVMED , NM-001-108-109.6
Unclassified report

Descriptors: (*Personality, Psychometrics), Attitudes, Leadership, Naval personnel, Correlation techniques, Test construction (Psychology), Analysis, of variance

Among the most critical problems in the measurement of authoritarian tendency is the isolation of distinct sources of variance in the authoritarian syndrome as presently understood. An earlier study reported the construction of the Pensacola Z Scale, which was designed to incorporate as much of the purely personal variance in authoritarianism as possible. However, the Z Scale itself contains at least four distinct sources of variance. The isolation and independent measurement of these sources constitute the problem toward which this study is directed.

AD-620 146 Div. 28/3
CFSTI Prices: HC $1.00 MF $0.50
OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS
PITCH RATINGS OF VOICED AND WHISPERED VOWELS.
Research rept.,
by George J. Harbold. 28 Feb 57, 11p. Rept. no. 67
Contract N6onr22525 Proj. NR-145-993
NAVMED , NM-18-02-99.1-67
Unclassified report

Prepared in cooperation with Naval School of Aviation Medicine, Pensacola Fla.

Descriptors: (*Psychacoustics, Pitch discrimination), (*Pitch discrimination, Speech), (*Speech, Sound pitch), Hearing, Speech representation

Twelve vowels were paired with each other in all combinations and each vowel was represented in both the initial and final positions of the pairs. Four speakers recorded randomized lists with whispered and voiced speech-types. Eight-nine listeners responded to the signals by indicating which member of each pair sounded higher in pitch. The data were treated by a method of paired comparisons (Guilford, Case V), and a rank order correlation was made showing relative relationships between speech-types. The results indicate, at least for those vowels that showed significant differences, that tonality may not be the sole determinant of listener's pitch judgments. A comparison of the rank orders of the present study and a rank order from a previous physical investigation provided further support to the hypothesis that the relative pitch of vowels is not independent of the vowel itself. (Author)

AD-620 150 Div. 28/3 ,16/15
CFSTI Prices: HC $1.00 MF $0.50
OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS
THE EFFECT OF NOISE-INDUCED TEMPORARY DEAFNESS UPON VOCAL INTENSITY.
Research rept.,
by John W. Black. 30 Jan 51, 11p. Rept. no. 7
Contract N6onr22525 Proj. NR-142-992
NAVMED , NM-001-064.01.07
Unclassified report

Prepared in cooperation with Naval School of Aviation Medicine, Pensacola, Fla.

Descriptors: (*Psychoacoustics, Speech), (*Speech, Psychoacoustics), (*Auditory acuity, Noise), Hearing, Deafness, Thresholds (Physiology), Intensity, Aviation medicine

Twenty-four groups of males, six members per group, read phrases before and after 120 minutes exposure to simulated cock-pit noise. At the time of the reading a threshold measurement was secured of the readers' auditory acuity at 512 c.p.s. The exposure to noise reduced the mean hearing values nine decibels and increased the vocal intensity half of this amount. The recovery in neither instance was complete after 15 minutes of silence. The trends of recovery, in so far as they progressed, were linear in both sets of measures. Vocal intensity is apparently not solely a function of the intensity of the airborne side-tone. (Author)

AD-620 160 Div. 28/1 ,28/4
CFSTI Prices: HC $1.00 MF $0.50
SYRACUSE UNIV N Y
VERBAL CONDITIONING BY A SIMULATED EXPERIMENTER.
Technical rept.,
by Richard Videbeck, and Henry Bates. 0 Apr 65, 15p. Rept. no. TR-16
Contract Nonr229602
Unclassified report

Prepared in cooperation with Missouri Univ. Rept. on A Program for the Study of Role Theory.

Descriptors: (*Verbal behavior, Conditioned reflex), (*Learning, Verbal behavior), Personality, Perception (Psychology), Psychometrics, Digital computers, Programming (Computers), Simulation

The present study sought to control for absolute consistency in experimenter behavior and reaction to the subject's verbal emissions. To attain this end, a computer was programmed to simulate the functions of the experimenter. Not only were the instructions to the subject and the experimental stimuli presented in a standardized manner, but invariance in the reinforcing operations was attained. The computer was programmed to recognize the preselected response class and reinforce it with the typed message 'very good.' The result is a highly replicable and consistent presentation of stimuli and reinforcement.

AD-620 183 Div. 28/5 ,28/4
CFSTI Prices: HC $2.00 MF $0.50
TUFTS UNIV MEDFORD MASS
THE MEASUREMENT OF CONFIDENCE AND TRUST.
Technical rept. no. 8, Mar 64-Mar 65,
by Thornton B. Roby, and Teresa Carterette. 0 Apr 65, 35p. Contract AF 19 628 2450, nonr49415 Proj. 7682 Task 768203
Unclassified report

See also AD-619 953.

Descriptors: (*Decision making, Group dynamics), (*Group dynamics, Decision making), Attitudes, Probability, Game theory, Psychometrics, Mathematical analysis

The report is concerned with the development of a research methodology and a theoretical framework for investigating the effects of social influence in a simple judgmental situation. The laboratory task entails a simple binary judgment as to whether a displayed angle departs from 90 degrees; before making his own response the subject is provided with the answer of a hypothetical partner, programmed at a certain fixed accuracy level. The responses are made in terms of a special betting scheme which penalizes the subject for overstating or understating his confidence. The two main experimental variables in this study are the difficulty of the discrimination and the announced reliability of the hypothetical partner. Theoretical predictions as to the effects of these variables on the relative value of confidence measures are confirmed. However, further methodological development is required to increase the realism of subjects' confidence scores. (Author)

AD-620 184 Div. 28/1
CFSTI Prices: HC $1.00 MF $0.50
PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF PSYCHOLOGY
ANTICIPATION AND RECALL METHODS IN PAIRED ASSOCIATE LEARNING: EFFECTS OF RATE OF ITEM PRESENTATION, ITEM TYPE, AND INTRA-AND INTER-ITEM SIMILARITY.
Technical rept.,
by Charles N. Cofer, and Richard A. Olsen. 0 Jul 65, 13p. Rept. no. TR-6
Contract Nonr65630 Proj. NR-154-161
Unclassified report

Descriptors: (*Word association, Learning), (*Learning, Word association), Recall, Verbal behavior, Psychometrics, Males, Females

Three experiments comparing recall and anticipation methods in paired associate learning are reported. In the first, word-number pairs were used with three exposure intervals, and learning was superior under recall. In the second, CVC trigram pairs were employed, with three levels of intra-pair (S-R) similarity. Recall was again superior, overall, the major difference appearing at moderate similarity. Sex differences appear. In the third experiment, inter-stimulus or inter-response similarity was varied, with CVC trigram pairs. The major effect here was from sex differences. Across all experiments, females tend to perform better on recall than on anticipation, whereas males tend to be inconsistent and to show smaller differences when they occur. (Author)

AD-620 190 Div. 28/1
CFSTI Prices: HC $1.00 MF $0.50
PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF PSYCHOLOGY
SOME EVIDENCE FOR CODING PROCESSES DERIVED FROM CLUSTERING IN FREE RECALL.
Technical rept.,
by Charles N. Cofer. 0 Apr 65, 11p. Rept. no. TR-4
Contract Nonr65630 Proj. NR154-161
Unclassified report

Descriptors: (*Work association, Recall), (*Recall, Word association), Verbal behavior, Learning, Psychology

Clustering in free recall has often been interpreted as arising from use of the category name as a coding response. Data relevant to this interpretation are presented and interpreted with regard to three free recall situations in which clustering is observed. It is concluded that category names do not play roles in clustering in the category clustering situation or in the difference in clustering found for sets of words which comprise all the items of a category as compared with word sets which do not exhaust a category. However, there is evidence that the greater clustering found for categorized pair members than for non-categorized pair members with equal associative overlap may be due to the greater codability of the categorized pairs. (Author)

AD-620 191 Div. 28/1
CFSTI Prices: HC $1.00 MF $0.50
PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF PSYCHOLOGY
LEARNING OF CONTENT AND FUNCTION WORDS IN NONSENSE SYLLABLE FRAMES: A REPETITION AND EXTENSION OF GLANZER'S EXPERIMENT.
Technical rept.,
by Charles N. Cofer. 0 Jun 65, 11p. Rept. no. TR-5
Contract Nonr65630 Proj. NR-154-161
Unclassified report

Descriptors: (*Learning, Word association), (*Word association, Learning), Verbal behavior, Speech representation, Psychology

Glanzer has reported that in paired-associate learning response triplets containing function words bounded by two nonsense syllables are learned significantly more readily than similar triplets containing content words. This finding was replicated in Experiment I but in experiments in which exposure intervals were lengthened and in which short words were substituted for long words used by Glanzer the effects of grammatical class on the learning of the triplets were not significant. Pronunciability of the triplets was found to be predictive of their learning. (Author)

AD-620 192 Div. 28/1
CFSTI Prices: HC $1.00 MF $0.50
PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF PSYCHOLOGY
MEASURES OF ASSOCIATIVE OVER-LAP AND PAIRED-ASSOCIATE LEARNING.
Technical rept.,
by Charles N. Cofer. 0 Jul 65, 9p. Rept. no. TR-7
Contract Nonr65630
Unclassified report

Descriptors: (*Word association, Learning), (*Learning, Word association), Recall, Verbal behavior, Psychometrics, Males, Females

Associative overlap, pattern of association and category membership of pairs of words were investigated in two paired-associate learning experiments, and word sets varying in two ways associatively were studied in a third experiment in which several stimuli were paired with a single response. Category membership influenced paired-associate learning, but amount and pattern of associative overlap did not. In the multiple stimuli learning situation, effects were observed in relation to both ways of measuring associative overlap. (Author)

AD-620 213 **See Fld. 6/15**

AD-620 257 Div. 28/3 ,16/1
CFSTI Prices: HC $1.00 MF $0.50
CENTRAL INST FOR THE DEAF ST LOUIS MO
THE RELATION BETWEEN MANIFEST ANXIETY AND RATE OF EYEBLINK IN A STRESS SITUATION.
Research rept.,
by Donald G. Doehring. 13 Dec 57, 13p. Contract Nonr115102 Proj. NR-146-092 ,NM-13-01-99 Task 1
NAVMED , NM-13-01-99-1-6
Unclassified report

Prepared in cooperation with Naval School of Aviation Medicine, Pensacola, Fla.

Descriptors: (*Anxiety, Motro reactions), (*Word association, Anxiety), Eye, Reflexes, Stress (Psychology), Naval personnel

Rate of eyeblink can be used an an index of generalized muscular tension. It has been found that in certain learning situations anxious individuals exhibit a large amount of muscular tension as compared with non-anxious individuals. The present experiment was designed to determine (1) whether blink-rate increases in a verbal stress situation, and (2) whether blink-rate responses in this situation are positively related to anxiety level. A free association test of 17 words was administered to 24 naval aviation cadets. The test was made up of words classified as stressful, mildly stressful, and non-stressful. Eyeblink responses to each word were determined, and several measures of blink rate were correlated with two measures of anxiety level - the Taylor Anxiety Scale and the Saslow Screening Inventory. The words classified as stressful evoked a significantly larger number of eyeblinks than the words classified as non-stressful. There was a significant positive correlation between blink-rate response to stressful and anxiety level as measured by the Saslow Screening Inventory. Anxiety level was uncorrelated with response to non-stressful words. Verbal stress thus appears to produce increased muscular tension, and anxious individuals exhibit more tension than non-anxious individuals in response to verbal stress stimuli but not in response to neutral verbal stimuli. (Author)

AD-620 261 Div. 28/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
A NOTE ON RESPONSES TO FACES OF OTHERS.
Research rept.,
by Wilse B. Webb. 4 Mar 75, 6p.
NAVMED , NM-16-01-11.2-7
Unclassified report

Descriptors: (*Face, Reaction (Psychology)), (*Reaction (Psychology), Face), Photographs, Attitudes, Naval personnel, Social psychology

Ninety-four cadets rated the 'likeability' of pictures of 30 cadets unknown to them. Each of the cadet's faces being rated was shown in three poses: smiling, in repose, and in profile. The likeableness of the faces was quite stable for all three poses. The smiling faces received considerably more favorable responses than did the other two poses. The relative likeableness of the faces in different poses were not highly related. The range of groups positive and negative responses to the faces was quite broad. (Author)

AD-620 262 Div. 28/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
A NOTE ON THE RELIABILITY OF TWO METHODS OF PROTOCOL ANALYSIS.
Research rept.,
by Wilse B. Webb, and Joseph C. Kaspar. 8 Mar 57, 6p. Proj. NM-16-01-11 Task 2
NAVMED , NM-16-01-11.2-8
Unclassified report

Descriptors: (*Attitudes, Naval Personnel), (*Projective techniques, Reliability), Aviation personnel, Naval training, Correlation techniques

For several months entering cadet classes were asked to write an answer to this question: 'What do you think of a person who voluntarily attrites from the flight training program.' Replies were sorted along the favorable-unfavorable continuum. Two psychologists found low consistency in the sorting of the protocols. A third psychologist and intensive efforts in developing detailed instructions for sorting did little to improve matters. It was concluded that the analysis of protocol responses to such a specified question as was asked, on even so simply a dimension as favorable-unfavorable, was a difficult task and deserved further consideration. The specific problem of protocol analysis dealt with in this study was the question of analysis by whole or gestalt analyses versus sentence by sentence or part analyses of protocols.

AD-620 263 Div. 28/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
A STUDY OF INTELLECTUAL ACTIVITY IN A NOISY ENVIRONMENT.
Research rept.,
by William A. Wilbanks, Wilse B. Webb, and Gilbert C.Tolhurst. 31 Oct 56, 16p. Proj. NM-001-104-100
NAVMED , NM-001-104-100-1
Unclassified report

Descriptors: (*Noise, Reaction (Psychology)), (*Performance (Human), Noise), Reasoning, Aptitude tests, Naval personnel, Tolerances (Physiology), Statistical analysis

Four tests from the Differential Aptitude Tests were given to naval aviation cadets under normal testing conditions and with a 100 decibel background noise. Significantly higher scores were obtained under noise on the DAT Clerical Speed and Accuracy test. This effect could be demonstrated only when ability differences among the cadets were controlled. It was also found that individuals maintain their relative position within the population in both noise and quiet. The implications for selection are discussed. (Author)

AD-620 265 Div. 28/4
CFSTI Prices: HC $1.00 MF $0.50
NORTHWESTERN UNIV EVANSTON ILL
EXAMPLES OF NORMAL AND DEVIANT VOCABULARY RESPONSES AS RATED BY CLINICAL PSYCHOLOGISTS.
Interim rept.,
by William A. Hunt, and Ronald E. Walker. 0 Aug 65, 24p. Contract Nonr122818
Unclassified report

Descriptors: (*Verbal behavior, Mental disorders), (*Mental disorders, Verbal behavior), (*Abnormal psychology, Verbal behavior), Diagnosis, Neuroses, Psychoses, Reaction (Psychology), Psychometrics

The paper presents 236 responses to vocabulary test items given by normals, schizophrenics, organics, psychoneurotics, and retardates. Each item is scaled on a 7-point scale for confusion in thinking, communicability, concrete abstract, and potential intelligence. The material is being made available for teaching purposes. (Author)

AD-620 266 Div. 28/4
CFSTI Prices: HC $1.00 MF $0.50
NORTHWESTERN UNIV EVANSTON ILL
SOME FACTORS INFLUENCING CLINICAL JUDGMENT.
Final rept. for Aug 60-Sep 65,
by William A. Hunt, and Ronald E. Walker. 31 Aug 65, 21p. Contract Nonr122818
Unclassified report

Descriptors: (*Abnormal psychology, Diagnosis), (*Mental disorders, Diagnosis), Learning, Anxiety, Verbal behavior, Neuroses, Psychoses, Psychometrics

After a previous study of clinical judgment using the analogical method in which the principles of classical psychophysics were applied to the investigation of clinical judgment, a survey of the literature encouraged the authors to extend the use of this method by attempting to apply learning theory to the judgmental situation. The present report gives the results of the application of drive theory as used in the study of manifest anxiety and an attempt to apply simple reinforcement principles (with less promising results). Several studies of the diagnostic judgment per se are included dealing with the problem of diagnostic judgment as a function of amount of information, and with the effects of diagnostic bias. A number of tangential studies are also included. (Author)

AD-620 272 **See Fld. 5/9**

AD-620 286 Div. 28/3 ,8/7
CFSTI Prices: HC $1.00 MF $0.50
OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS
A STUDY OF INTELLIGIBILITY AND SELECTIVE FILTERING WITH A UNIDIRECTIONAL COMMUNICATIONS NET.
Research rept.,
by William E. Evans. 15 Dec 55, 19p. Contract N6ONR22525 Proj. NR145 993
NAVMED , NM001.104-500-62
Unclassified report

Prepared in cooperation with Naval School of Aviation Medicine, Pensacola, Fla.

Descriptors: (*Intelligibility, Voice communication systems), (*Voice communication systems, Intelligibility), Speech transmission, Filters (Electromagnetic wave), Bandwidth, Psychoacoustics, Hearing, Human engineering, Correlation techniques, Analysis of variance, Tables

Seventy-five male college students served as subjects in 25 teams of three individuals per team. Each team manned a station in a unidirectional communications network. Criterion scores of per cent intelligibility (Stations one and two) and total word reception (Stations two and three) were obtained using multiple-choice intelligibility tests. Various portions of the test were filtered into five different frequency band widths. The selected filtering conditions acted upon the multiplechoice verbal material in a manner comparable to other types of speech tests, differentially affecting the magnitude of information loss usually found when a message is relayed. There was no evidence found for a decrement in total number of words transmitted per unit time due to selective filtering or retransmission. (Author)

AD-620 305 Div. 28/4 ,23/5
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
AN ANALYSIS OF METHODS FOR MEASURING FLIGHT INSTRUCTOR PROFICIENCY THROUGH STUDENT RATINGS.
Research rept.,
by Richard Trumbull, and W. E. Vinacke. 10 Nov 45, 43p. Proj. X673Av355a
NAVMED , X-673 (Av-355-a)-1
Unclassified report

Available only for reference use at DDC field services. Copy is not available for public sale.

Descriptors: (*Instructors, Effectiveness), (*Aviation personnel), (*Students, Public opinion), Psychometrics, Selection, Military training, Analysis, Scale

An analysis of the Diagnostic Scale for Rating Flight Instructors was undertaken. The items of this scale measure student opinion regarding their instructors. Each question was evaluated in terms of discrimination between good and poor instructors, consistency, and relevance to flight instruction. Fourteen questions, not meeting these standards, were eliminated. A scoring technique was developed for the remaining 21 questions in order to provide an objective profile of instructor proficiency. Applications of such data to Improvement of flight instruction were discussed. Also developed was an experimental questionnaire designed to expand the value of the method. Twenty-one out of thirty-five items of the Diagnostic Scale for Rating Flight Instructors are established as satisfactory for the measurement of flight instructors. Questions retained differentiate good from poor instructors, are consistent, and are relevant to the task of flight instruction. The questions may be scored objectively and recorded on a profile for used as a counselling aid in improvement of instruction. A new questionnaire based upon these items, and including experimental items, is presented, pending final evaluation. (Author)

AD-620 308 Div. 28/4 ,28/3
CFSTI Prices: HC $1.00 MF $0.50
OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS
A RATING SCALE TECHNIQUE FOR THE MEASUREMENT OF SPEAKER INTELLIGIBILITY.
Research rept.,
by Robert W. Peters. 8 Feb 57. 16p. Rept. no. 68
Contract N6ONR22525 Proj. NM18 02 99, NR143 993 Task 1
Unclassified report

Research done in cooperation with Naval School of Aviation Medicine, Pensacola, Fla.

Descriptors: (*Psychoacoustics, Speech), (*Speech, Intelligibility), (*Intelligibility, Measurement), Psychometrics, Voice communication systems, Signal-to-noise ratio, Correlation techniques, Analysis of variance

An evaluation was made of the method of measuring speaker intelligibility by listener ratings of voice samples on an equal-appearing intervals scale. Twenty-four speakers and seven panels of listeners, with a minimum of 20 persons in each panel, were involved in the experiment. Recordings were made of each speaker reading multiple-choice intelligibility test word lists and prose material. Ten-second voice samples were prepared from the prose reading. The multiple-choice test material was played for listener panels to provide for each speaker a percent inteiligibility score. The ten-second voice samples were played for listening panels under various listening conditions to provide for each speaker a scale value intelligibility score. These listening conditions were that of hearing the voice signal in quiet and at the S/N ratios of +5 db, 0 db, and -5 db. Correlation coefficients were determined between multiple-choice and scale value scores to provide an estimate of the validity of the rating method. An analysis of variance was used to test the significance of the differences among the mean scale values with respect to the different listening conditions. Moderately high positive correlations between multiple-choice and scale value intelligibility scores suggest that the rating scale method provides a fairly good estimate of speaker intelligibility. Q-values, which provide an index of reliability, were within reasonable limits. (Author)

AD-620 315 Div. 28/3 ,16/15,8/7
CFSTI Prices: HC $1.00 MF $0.50
OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS
THE EFFECTS OF DISRUPTING THE SIMULTANEITY OF VISUAL-AURAL COMMUNICATION CHANNELS TO A SPEAKER.
Research rept.,
by Gilbert C. Tolhurst. 20 Dec 56. 12p. Contract N6ONR22525 Proj. NR145 993 ,NM18 02 99 Task 1
NAVMED , NM-18-02-99-1-66
Unclassified report

Prepared in cooperation with Naval School of Aviation Medicine, Pensacola, Fla.

Descriptors: (*Speech, Intelligibility), (*Psychoacoustics, Speech), Auditory signals, Visual signals, Voice communication systems, Speech representation, Sound, Analysis of variance

Forty-eight speakers received the messages they were to impart to listeners in a face-to-face situation. For 24 of them the aural channel was delayed 0.23 second from that of the visual. The experimental design yielded criterion scores applicable to the reduction by an analysis of variance. The effect of dissynchrony of the aural-visual signals upon the speakers was not to change the intelligibility of speech or the sound pressure level of voice. There was a significant change, namely, lengthening the time of phrase duration. (Author)

AD-620 320 **See Fld. 5/9**

AD-620 321 Div. 28/5 ,32/9
CFSTI Prices: HC $3.00 MF $0.75
NAVAL PERSONNEL RESEARCH ACTIVITY SAN DIEGO CALIF
NAVAL ADJUSTMENT AND DELINQUENCY: A REVIEW OF THE LITERATURE WITH RECOMMENDATIONS FOR FUTURE RESEARCH.
Interim rept. for Aug 63-Oct 64, (Research memo),
by Richard R. Stephenson. 0 May 65, 74p. Rept. no. SRM-64-23
Proj. 3 1605 05 01S2
Unclassified report

Descriptors: (*Naval personnel, Delinquency), (*Delinquency, Naval personnel), Adjustment (Psychology), Reviews, Psychometrics, Sociometrics

A comprehensive review of the literature concerning the naval delinquency problem was undertaken. This review led to a summarization of all relevant research findings and a further summarization of the recommendations of earlier writers in this area. Following a critical evaluation of both summaries and of the assumptions underlying the traditional approach, it was concluded that the traditional approach to the identification of the delinquentprone was approaching an asymptote of effectiveness. Accordingly, a new approach, based upon the concepts of occupational choice, satisfaction, and adjustment, is recommended. A comprehensive, but general, research design is proposed to investigate and evaluate this new approach. (Author)

AD-620 333 Div. 28/4 ,28/3
CFSTI Prices: HC $3.00 MF $0.75
DARTMOUTH COLL HANOVER N H
AFFECTIVE COMMUNICATION IN SPEECH AND RELATED QUANTITATIVE PROBLEMS.
Final rept. for 15 Apr 63-14 Apr 65,
by Victor E. McGee. 26 Jul 65. 57p. Contract Nonr389705
Unclassified report

Descriptors: (*Voice communication systems, Psychoacoustics), (*Psychoacoustics, Speech), (*Speech, Intelligibility), (*Intelligibility, Measurement), Speech transmission, Acoustic properties, Auditory perception, Distortion, Psychometrics, Perception (Psychology), Speech representation, Mathematical analysis, Tables

The research project was designed to investigate by various means those kinds of information in speech which do not deal directly with the actual verbal message per se. The name given to this non-verbal information is 'affective information'. The work attempted to make use of the physical information in the speech processing system to predict the 'intelligibility' of the speech signal. Intelligibility as here defined is synonymous with fidelity of transmission since the subject's response is merely a repetition of the perceived input signal. With respect to affective information the goal has been to identify as far as possible the acoustical properties of the speech signal which are identified with various perceptual responses to that speech signal. The first non-verbal aspect that was considered was 'speech quality'. Since this concept is of considerable importance both in the technology of speech processing developments and from a psychological point of view, various attempts at defining psychoacoustical correspondences have been made during the term of this project.

AD-620 336 **See Fld. 6/16**

AD-620 340 **See Fld. 6/1**

AD-620 341 Div. 28/5
CFSTI Prices: HC $2.00 MF $0.50
GEORGIA INST OF TECH ATLANTA
AN INTRODUCTORY STUDY OF THE NATURE OF CREATIVITY.
Master's thesis,
by Hulic B. Ratterree. 0 Jun 65, 41p. Contract AF33 608 1063
Unclassified report

Descriptors: (*Performance (Human), Analysis), Personality, Behavior, Attitudes, Reaction (Psychology), Education, Social psychology, Reasoning

An introductory study is made of the nature of creativity. The method utilized is a search of the literature for experimental and historical evidence coupled with personal observation and experience. Areas that are investigated for their relationship to creativity are effort, education, habits or previous experience, and encouragement and discouragement. (Author)

AD-620 342 **See Fld. 5/2**

AD-620 343 Div. 28/2 ,28/3
CFSTI Prices: HC $4.00 MF $0.75
TEXAS TECHNOLOGICAL COLL LUBBOCK SCHOOL OF ENGINEERING

AN ANALYSIS OF THE CENTER OF GRAVITY OF THE ARM DURING CERTAIN SIMULATED INDUSTRIAL MOVEMENTS.
Master's thesis,
by Virgil Bennie McElhannon. 0 May 65. 125p.
Contract AF33 608 1119

Unclassified report

Descriptors: (*Arms, Center of gravity), (*Human engineering, Arms), Biophysics, Industrial psychology, Motion, Simulation, Velocity, Mechanics, Time studies, Anthropometry, Analysis

The purpose of the study is to investigate the center of gravity of the total arm complex during certain work movements typical of those in use in industrial tasks. The center of gravity characteristics investigated are the distance and path traveled and the nature and behavior of the velocity of the center of gravity during that travel. The results of the study can be used to further the available knowledge of applying classical mechanical laws to the human body in motion.

AD-620 375 See Fld. 5/9

AD-620 377 Div. 28/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
AVOIDANCE LEARNING AS A FUNCTION OF CONDITIONED STIMULUS VARIABLES.
Research rept.,
by Marvin Schwartz. 29 Mar 57, 13p. Rept. no. 1
Proj. NM16 01 11 Task 9

Unclassified report

Descriptors: (*Learning, Conditioned reflex), (*Conditioned reflex, Learning), Performance tests, Training, Motivation, Stimulation, Illumination, Analysis of variance, Rats

The present report presents data concerned with the effects of varying several parameters of the conditioned stimulus (CS) on performance of an avoidance response. Findings: (1) Differences due to training procedure are of greater importance in determining avoidance of performance than are differences attributable to the direction of change of CS energy. (2) Avoidance response strength is greater if the change in CS energy is greater, irrespective of the rate or direction of the change. (3) In a shuttlebox apparatus, avoidance response strength is greater with a six second CS-US interval than with a three second interval. (4) Some of the parameters of the CS (primarily the rate of CS change) interact with each other to influence stimulus discriminability. (Author)

AD-620 413 See Fld. 6/16

AD-620 423 Div. 28/1
CFSTI Prices: HC $1.00 MF $0.50
PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF PSYCHOLOGY
MEASURES OF VERBAL FLUENCY AND PAIRED ASSOCIATE LEARNING: A PILOT STUDY.
Technical rept. on Learning, Retention, and Recovery of Meaningful Materials,
by Charles N. Cofer. 0 Aug 65. 8p. Rept. no. TR-8
Contract Nonr65630 Proj. NR154 161

Unclassified report

Descriptors: (*Learning, Word association), (*Word association, Selection), Reasoning, Verbal behavior, Personality, Psychometrics

The results of the study give some limited support to the notion that fluency under conditions requiring response selection may be related to performance in verbal paired-associate learning. The p-word test scores produced a borderline significance value in relation to CVC pair learning scores, and the extreme groups on the p-word test differed signfiicantly on word pair learning scores. The S-L test showed no relation to learning scores. The similar-words test showed a relation of CVC pair learning scores but not to word pair learning scores. (Author)

AD-620 444 See Fld. 6/16

AD-620 451 Div. 16/12,28/5
CFSTI Prices: HC $4.00 MF $0.75
HOUSTON UNIV TEX
A COMPARATIVE STUDY OF VARIABLES RELATED TO PSYCHIC TRAUMA IN THE LIFE HISTORIES OF SCHIZOPHRENICS AND MATCHED NORMALS.
Doctoral thesis,
by Bob L. Carpenter. 0 Jun 65. 108p. Contract AF33 608 1067

Unclassified report

Descriptors: (*Psychoses, Etiology), Mental disorders, Pathology, Diagnosis, Personality, History, Psychiatry, Analysis, Adjustment (Psychology), Abnormal psychology, Analysis of variance

The primary purposes of the study were: (1) the systematic investigation of the antecedent histories of two matched populations (102 schizophrenics and their controls) for 'pathogenic' events that might be predisposing to mental illness, and (2) the evaluation of the use of antecedent histories in establishing diagnosis and planning a course of treatment. Sixty-four of the items on the Biographical Questionnaire were found to be significant at the .10 level or less. These results indicated that the schizophrenic population reported the occurrence of 'pathogenic' events more frequently than the normals. Three factors evolved from the findings of this research. They are: (1) that the mentally ill perceive and report more occurrences of 'pathogenic' events or experiences in their life histories than do normals, (2) that the disturbed personality of the schizophrenic is not related to one isolated incident of 'psychic' trauma or 'pathogenic event'--it is a summation of these events occurring at the proper time during the developmental period that appears to be predisposing to mental illness, and (3) that accurate life histories are of value to the psychologist and psychiatrist in evaluating and treating the disturbed personality. (Author)

AD-620 462 Div. 28/1
CFSTI Prices: HC $2.00 MF $0.50
TEXAS UNIV AUSTIN DEPT OF PSYCHOLOGY
COGNITIVE AND DRIVE FACTORS IN THE EXTINCTION OF THE CONDITIONED EYEBLINK IN HUMAN SUBJECTS.
Technical rept.,
by Kenneth W. Spence. 20 Jun 65. 33p. Rept. no. TR-1
Contract Nonr37518

Unclassified report

Descriptors: (*Eye, Conditioned reflex), (*Conditioned reflex, Humans), Behavior, Performance (Human), Learning, Reflexes, Animals, Stimulation, Motivation, Psychometrics

It is apparent from the data of recent experiments concerned with the extinction of the conditioned eyelid response in human subjects that the decrement in response strength that occurs during extinction is dependent upon a number of factors other than some negative effect (inhibition) resulting directly from the successive nonreinforced trials. In the standard conditioning experiment as heretofore conducted with humans, the response decrement during extinction has been shown to be primarily a function of factors relating to the subject's capability of discriminating the change in stimulus conditions with shift from acquisition to extinction. Our results with a new masking situation in which the conditioning experiment is imbedded in a probability learning task indicates that when these cognitive factors are controlled (eliminated) and drive level is maintained, extinction of the eyelid response in humans proceeds at a relatively slow rate just as it does in animals. The results also suggest that under these conditions there is no partial reinforcement effect. (Author)

AD-620 463 Div. 28/1
CFSTI Prices: HC $1.00 MF $0.50
TEXAS UNIV AUSTIN DEPT OF PSYCHOLOGY
INDIVIDUAL DIFFERENCES IN HUMAN EYELID CONDITIONING.
Technical rept.,
by Kenneth W. Spence. 12 Jul 65. 9p. Rept. no. TR-3
Contract Nonr37518

Unclassified report

Descriptors: (*Conditioned reflex, Humans), (*Eye, Conditioned reflex), Performance (Human), Learning, Motivation, Stimulation, Reflexes, Correlation technique, Psychometrics

Previous research data suggest that human subjects exhibit fairly consistent performance from one conditioning experience to another. The present study, undertaken primarily for other purposes, provides more substantial data as to the consistency of performance in the successive conditioning of the eyeblink to different stimuli, first a tone and then a light.

AD-620 496 See Fld. 9/2

AD-620 522 Div. 28/1
CFSTI Prices: HC $1.00 MF $0.50
TEXAS UNIV AUSTIN DEPT OF PSYCHOLOGY
SEX AND ANXIETY DIFFERENCES IN EYELID CONDITIONING.
Technical rept. on Motivation and Performance in Conditioning and Learning,
by Kenneth W. Spence, and Janet T. Spence. 23 Jul 65. 19p. Rept. no. TR-4
Contract Nonr37518

Unclassified report

Descriptors: (*Conditioned reflex, Humans), (*Eye, Conditioned reflex), Learning, Anxiety, Sex, Emotions, Reaction (Psychology), Reflexes, Performance (Human), Psychometrics

Published and unpublished data bearing on the relationship between eyelid conditioning performance and two subject variables, Ss' sex and their scores on the Manifest Anxiety Scale, were examined. Although the differences between groups were not always significant, particularly in the case of sex, the evidence from studies employing standard conditioning procedures revealed that in 23 out of 27 independent comparisons the performance of high anxiety Ss was superior to that of low anxiety Ss and that in 18 out of 19 comparisons, the performance of females was superior to that of males. The probability of obtaining this number of differences in one direction by chance was in each case less than .01. In contrast, inspection of the data from studies using a procedure in which the conditioning was masked by being presented within the context of a probability learning task indicated that none of the differences between groups was significant for either subject variable and that the direction of difference between groups was split approximately equally between high and low anxiety Ss and between males and females. The findings were discussed in terms of the writers' theory that the performance differences between high and low anxious Ss and between male and female Ss reflect differences in their drive levels, which, in turn, are assumed to be the result of differences in the level of emotional reactivity of the Ss to the experimental situation and procedures. (Author)

AD-620 523 Div. 28/1
CFSTI Prices: HC $2.00 MF $0.50
TEXAS UNIV AUSTIN DEPT OF PSYCHOLOGY

UCS INTENSITY AND PERFORMANCE IN EYELID CONDITIONING.
Technical rept.,
by Kenneth W. Spence, and John R. Platt. 2 Jul 65, 30p. Rept. no. TR-2
Contract Nonr37518 Proj. NR154 107
Unclassified report

Report on Motivation and Performance in Conditioning and Learning.

Descriptors: (*Conditioned reflex, Humans), (*Eye, Conditioned reflex), Performance (Human), Motivation, Anxiety, Learning, Psychometrics, Analysis of variance

Studies of the effects of UCS intensity on performance in human eyelid conditioning were reviewed, particularly with respect to a recent claim that this variable determines the proportion of Ss who condition and not the performance level of individual Ss. The evidence reviewed clearly indicated that UCS intensity does affect the level of performance in Ss who condition. The function involved appeared to be negatively accelerated and to approach an asymptote within a relatively small range of intensity values. These effects of UCS intensity were interpreted as reflecting both motivational (D) and associative (H) factors. (Author)

AD-620 536 See Fld. 6/16

AD-620 606 Div. 28/5 ,23/5
CFSTI Prices: HC $3.00 MF $0.75
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
SYSTEM TRAINING AND RESEARCH IN TEAM BEHAVIOR.
Technical memo.,
by Lawrence T. Alexander, and Alvin S. Cooperband. 16 Aug 65, 68p. Rept. no. TM-2581
Unclassified report

Descriptors: (*Group dynamics, Training), (*Training, Group dynamics), (*Command + control systems, Training), Behavior, Learning, Performance (Human), Computers, Models (Simulations), Systems engineering, Scheduling

Characteristics of computerized command-control systems are considered to identify common training objectives. Several system training problems are identified. The importance of training a team to respond adequately to indeterminate situations is proposed as a primary training objective. Team training research literature is reviewed and a research program is outlined. (Author)

AD-620 617 Div. 28/4
DARTMOUTH COLL HANOVER N H
NONE ON AN 'ELASTIC' MULTIDIMENSIONAL SCALING PROCEDURE,
by Victor McGee. 18 Jun 65, 2p. Contract Nonr389705
Unclassified report

Pub. in Perceptual and Motor Skills v21 p81-2 1965. (Copies not available to DDC or Clearinghouse customers). Available after Aug 65 from the author.

Descriptors: (*Psychometrics, Numerical methods + procedures), (*Motor reactions, Psychometrics), Statistical tests, Programming languages

A new orientation and a hybrid technique of multidimensional scaling are introduced in the interests of rational theoretical underpinnings and efficient numerical computation. (Author)

AD-620 627 See Fld. 5/9

AD-620 654 See Fld. 13/2

AD-620 668 See Fld. 5/9

AD-620 681 Div. 28/5
CFSTI Prices: HC $1.00 MF $0.50
MICHIGAN UNIV ANN ARBOR RESEARCH CENTER FOR GROUP DYNAMICS
SOCIAL FACILITATION OF DOMINANT AND SUBORDINATE RESPONSES.
Technical rept.,
by Robert B. Zajonc, and Stephen M. Sales. 1 Sep 65, 19p. Rept. no. TR-33
Contract Nonr122434 Grant ,NSF GS629 Proj. NR170 309
Unclassified report

Descriptors: (*Social psychology, Behavior), (*Behavior, Social psychology), Performance (Human), Learning, Verbal behavior, Motivation, Reaction (Psychology), Stimulation, Perception (Psychology), Training, Psychometrics, Analysis of variance

The purpose of the study was to examine the effects of an audience on the emission of dominant and subordinate responses. A procedure (previously used by Zajonc and Nieuwenhuyse, 1964) which was sensitive to drive effects was employed. It was predicted that response emission in the pseudo-recognition task would be characterized by an interaction between the habit-strength and the audience-variables.

AD-620 702 Div. 28/5 ,28/1
MICHIGAN UNIV ANN ARBOR
THE LEARNING OF BALANCED AND UNBALANCED SOCIAL STRUCTURES,
by Robert B. Zajonc, and Eugene Burnstein. 7 May 64, 16p. Contract Nonr122434 Proj. NR170 309
Unclassified report

Pub. in Journal of Personality, v33 n2 p153-63 Jun 1965. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Learning, Social psychology), (*Social psychology, Learning), Abnormal psychology, Personality, Attitudes, Psychometrics, Analysis of variance

Two findings emerged from the experiment. First, an unbalanced structure was found more difficult to learn than a balanced one but only when the issue was an important one. Second, negative relationships were found to be more difficult to learn than positive ones. This finding was independent of whether these relationships existed between two people or between a person and an issue.

AD-620 703 Div. 28/4 ,28/3 ,8/7
DARTMOUTH COLL HANOVER N H
DETERMINING PERCEPTUAL SPACES FOR THE QUALITY OF FILTERED SPEECH,
by Victor E. McGee. 23 Nov 64, 16p. Contract Nonr389705
Unclassified report

Pub. in Journal of Speech and Hearing Research, v8 n1 p23-38 Mar 1965 (Copies not available to DDC or Clearinghouse customers). Prepared in cooperation with Princeton Univ., N. J., Contract Nonr185815, Grant NSF G3407.

Descriptors: (*Psychoacoustics, Speech), (*Speech, Intelligibility), Hearing, Voice communication systems, Speech representation, Audiofrequency, Distortion, Acoustic filters, Measurement

Using one recorded voice, distorted in 15 different ways, a sample of listeners made similarity-with-respect-to-quality judgments for the complete paired comparison schedule. By means of an Eckart-Young type factoring procedure, four points of view among the listeners were isolated and the perceptual spaces for these points of view were determined. An implication of the 'mean' point of view was the operation of two response sets labeled 'lowest harmonics - YES' and 'lowest harmonics - NO'. (Author)

AD-620 715 Div. 28/1
CALIFORNIA UNIV BERKELEY
SHORT-TERM TEMPORAL CHANGES IN FREE RECALL,
by Leo Postman, and Laura W. Phillips. 30 May 64, 8p. Contract Nonr22290
Unclassified report

Pub. in The Quarterly Journal of Experimental Psychology v17 pt2 p132-8 May 1965. (Copies availably only to DDC users).

Descriptors: (*Word association, Recall), (*Recall, Word association), Retention, Verbal behavior, Psychometrics

An experimental study of short-term memory for lists of familiar English words is reported. Lists of 10, 20, and 30 unrelated words were presented at 1-sec. rate. Retention was measured by free recall after intervals of 0, 15 and 30 sec. A counting task was used to prevent rehearsal during the retention interval. The absolute level of recall increased with length of list whereas the percentages retained showed the reverse trend. The recall scores decreased steadily as a function of retention interval, with the rates of forgetting comparable for the three lengths of list. The decline in the amount recalled was due in large measure to the loss of the terminal items in the list. Consequently, the pronounced recency effect present on the immediate test of recall was progressively reduced as a function of time. By contrast retention of the initial part of the list was relatively stable. These variations in rate of forgetting are attributed to differences among serial positions in susceptibility to proactive inhibition. (Author)

AD-620 721 See Fld. 5/9

AD-620 722 See Fld. 5/9

AD-620 723 See Fld. 6/16

AD-620 726 Div. 28/3 ,16/1
TUFTS UNIV MEDFORD MASS INST FOR PSYCHOLOGICAL RESEARCH
ADAPTATION AND TRAINING EFFECTS IN ERG. IV. OVERVIEW OF EIGHT YEARS (0),
by Sanford J. Freedman, and Lucia Ronchi. 01964, 26p. Contract AF49 638 1282 Proj. 9778 Task 977801
AFOSR , 65-1309
Unclassified report

Pub. in Atti Della Fondazione Giorgio Ronchi v19 n5 p542-65 Sep-Oct 1964 (Copies available only to DDC users).

Descriptors: (*Psychophysiology, Vision), (*Vision, Measurement), Visual acuity, Learning, Adaptation (Physiology), Training, Retina, Eye, Stimulation, Conditioned reflex, Reviews

A summary is given of eight years of investigation of electroretinograms (ERG) Experimental results lend support to the conclusion that the ERG responses recorded in any particular experimental session are significantly affected by previous experience of the subject. It is indicated that ERG is not an objective, stable measure of visual function. Neither the absolute level of response to a fixed stimulus intensity nor the acuity of discrimination was constant for the observers tested. It is concluded that some kind of learning must be involved in ERG responses. A statistical treatment of the evidence is presented. (Author)

AD-620 748 See Fld. 6/16

AD-620 784 See Fld. 6/16

5/11. SOCIOLOGY

AD-620 218 Div. 32/2 ,31/5 ,31/4
BUREAU OF SHIPS WASHINGTON D C
BUREAU OF SHIPS THESAURUS OF DESCRIPTIVE TERMS AND CODE BOOK.
Second ed.
0 Mar 65, 685p. Rept. no. NAVSHIPS-0900-002-0000

Unclassified report

Available from Superintendent of Documents, GPO, Washington, D. C. 20402, HC $4.00, as D211.2T27/965. Available from CFSTI MF$2.75.

Descriptors: (*Informational retrieval, Vocabulary), (*Subject indexing, Vocabulary), Dictionaries, Naval research, Ships

The second edition of the Bureau of Ships Thesaurus of Descriptive Terms and Code Book, developed for use in conjunction with Project SHARP, contains approximately 4,600 main terms, an increase of nearly 100 new terms. Effort was concentrated on revising existing terms to display more realistic hierarchial and general relationships, inclusion of additional scope notes, and deletion of some outmoded and obsolete terms.

AD-620 321 See Fld. 5/10

AD-620 351 Div. 32/9
CFSTI Prices: HC $3.00 MF $0.75
BOSTON UNIV MASS SCHOOL OF PUBLIC COMMUNICATION
THE PETITVILLE STUDY: A TRI-DIMENSIONAL VIEW OF THE FUNCTION OF A WEEKLY NEWSPAPER.
Master's thesis,
by Francis Joseph Brown. 0 Aug 65, 96p. Contract AF33 608 1042

Unclassified report

Descriptors> (*Newspapers, Public opinion), (*Public opinion, Newspapers), Social communication, Sociology

The 'Independent' of Petitville, Mass., was studied in order to learn how the editor of the weekly newspaper, its readers, and the leaders of the community regard the position of the newspaper with respect to local matters. The editor of the 'Independent' and the school board of Petitville had tried to convince the townspeople in late 1964 to build a new junior high school and to approve an increase in taxes for that purpose. The townspeople defeated the measure in spite of the fact that they would be losing between $70,000 and $75,000 in state aid. The editor is regarded as having no conception of her audience, nor of the power structure in the community, and if writing at too high a level for the readers of such a paper as the 'Independent'. The school board members recognized the partisanship of the editor in the high school case and that this may have damaged the cause. The readers recognized the stand the newspaper took and possibly downgraded her credibility because of her lack of fairness.

6/1. BIOCHEMISTRY

AD-620 235 Div. 16/3 ,16/1
CFSTI Prices: HC $1.00 MF $0.50
FLORIDA STATE UNIV TALLAHASSEE
FACTORS CONTROLLING PROTEIN SYNTHESIS.
Final rept.,
by James R. Fisher. 25 May 65, 6p. Contract AF-AFOSR-233-63 Proj. 9777 Task 977701
AFOSR , 65-1198

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Proteins, Biosynthesis), (*Ribonucleic acids, Metabolism), (*Enzymes, Biosynthesis), (*Hormones, Physiology), Tissue culture cells, Neoplasms, Embryos, Oxidoreductases, Pituitary hormones

The purpose of the investigation is to understand the mechanism by which enzyme synthesis is controlled in developing systems. Efforts were made to confirm the RNA induction of enzymes in Ehrlich ascites cells. Attempts to develop a system of measuring the biological activity of RNA in this respect were unsuccessful. Studies were conducted on xanthine dehydrogenase in developing chick-embryo liver. It was concluded that the appearance of this enzyme is under hormonal control. Injections of prolactin, growth hormone, luteinizing hormone, folliclestimulating hormone and thyroid-stimulating hormone, individually, or as a mixture, did not give stimulation of activity. It is further concluded that either there is a new factor in the crude extract, or that a proper balance of 2 or more hormones is required. Similar studies were also conducted on mouse Ehrlich ascites cancer cells. First, crude anterior pituitary extract produced an increase in specific activity from 2- to 5-fold. Injections of the same hormones, either individually or in a mixture approximating pituitary tissue, caused a 2- to 7-fold increase in xanthine oxidase activity with only one injection 24 hrs before harvest of ascites cells, and a 9-fold increase after a series of three injections. (Author)

AD-620 240 Div. 16/3 ,16/4
CFSTI Prices: HC $1.00 MF $0.50
FLORIDA STATE UNIV TALLAHASSEE
RESEARCH IN PHOTOBIOLOGY AND PHOTOCHEMISTRY.
Final rept. for 1 May 64-30 Apr 65,
by H. Gaffron. 27 May 65, 4p. Contract AF AFOSR662 64
AFOSR , 65-1167

Unclassified report

Descriptors: (*Photosynthesis, Catalysis), (*Photochemistry, Catalysis), Organic pigments, Oxidation, Catalysts, Manganese

A brief summary is given of work involving the specificity of Mn catalysis during the oxidation of ascorbate to oxalic acid and of diketoglutonate to threonate. A list of publications generated under the grant is included.

AD-620 340 Div. 16/3 ,28/3
CFSTI Prices: HC $1.00 MF $0.50
GOTEBORG UNIV (SWEDEN) INST OF NEUROBIOLOGY
BIOCHEMICAL STUDIES OF NEURONS AND GLIA DURING LEARNING AND DIFFERENT FUNCTIONAL CONDITIONS.
Final rept. for 1 Oct 64-31 Mar 65,
by Holger Hyden. 31 Mar 65, 6p. Contract AF EOAR63 28 Proj. 9777 Task 977701
AFOSR , 1486

Unclassified report

Descriptors: (*Nerve cells, Biochemistry), (*Learning, Biochemistry), (*Ribonuccleic acids, Nerve cells), (*Proteins, Biochemical), Rats, Nucleotides, Genetics, Stimulation, Behavior, Chemical analysis, Sweden

A study was made with rats of the differentiation in RNA response in neurons early and late during learning. In early learning, nuclear RNA was formed with high adenine and uracil values, i.e., 26 and 28, respectively. Later during learning a 100% RNA/cell increase occurred, but the RNA had changed to a ribosomal type, i. e., A 21 G 35 C 24 U 20. It is concluded that early response with A-U rich RNA production reflects a genic stimulation in a learning situation never before encountered. Similarly, in behavioral tests, vestibular neurons produce nuclear RNA with high adenine and low uracil values when a difficult balancing is being learned. A study was also made of protein synthesis in isolated neurons and glia during learning. Two separate methods are described for the separation and determination of proteins: (1) An ultramicro method and (2) the use of tricyanoaminopropene to stimulate RNA synthesis in neurons. With these procedures, it is now possible to correlate protein synthesis in isolate neurons with their RNA synthesis and the type of RNA and base composition. (Author)

AD-620 473 Div. 16/3 ,16/4
ARMED FORCES INST OF PATHOLOGY ARMY MEDICAL CENTER WASHINGTON D C
KINETIC STUDIES ON THE THERMAL DENATURATION OF DEOXYRIBONUCLEIC ACID WITH A HIGH-FREQUENCY HEATING METHOD,
by Shiro Takashima, and Eugene A. Arnolds. 24 Jul 64, 12p. Proj. MRDC 61X99 26 00103

Unclassified report

Pub. in Biochimica et Biophysica Acta v94 p546-56 1965 (Copies available only to DDC users).

Descriptors: (*Desoxyribonucleic acids, Heating), Molecular structure, Induction heating, High frequency, Nucleotides, Urea, Decomposition, pH, Reaction kinetics, Guanine

The rate of heat denaturation of calf-thymus, salmonsperm and bacterial DNA's was studied with a highfrequency electric heating system. It was found that the rate of heat denaturation of DNA is rather slow, requiring more than 3 sec. The rate of denaturation is dependent on the guanine-cytosine content, and it is faster when the guanine-cytosine content is smaller. The rates are also faster below pH 5.0. Furthermore, the rate is faster in the presence of 8 M urea in the case of salmonsperm DNA but is not affected by urea in the case of calfthymus DNA. The relationship between the rate of unwinding and the length of DNA is also investigated but because of the possible presence of single-strand breaks, the results are complicated and no conclusion is reached concerning this problem. (Author)

AD-620 482 Div. 16/3 ,25/7
DUKE UNIV DURHAM N C DEPT OF PHYSICS
ELECTRON PARAMAGNETIC RESONANCE OF VANADYL IONS TRAPPED IN RNA AND DNA,
by Wallace Snipes, and Walter Gordy. 22 May 64, 5p. Contract AF AFOSR493 64 Proj. 9767 Task 976702
AFOSR , 65-1120

Unclassified report

Pub. in Journal of Chemical Physics v41 n11 p3661-2 Dec 1 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Ribonucleic acids, Impurities), (*Desoxyribonucleic acids, Impurities), (*Vanadium compounds, Paramagnetic resonance), Hyperfine structure, Ions

Electron resonances in RNA and DNA with a variety of intensities and line shapes have been found, most of which have been attributed to the transition element in the nucleic acid samples. In the present investigation, a well-resolved spectrum of 8 components was found in 3 commercially obtained samples of RNA. The octet appears to be a hyperfine structure arising from the V51 nucleus, for which I, the nuclear spin quantum number, = 7/2. The electron paramagnetic resonance spectrum is that of the vanadyl ion VO (2+) trapped in some manner in the RNA molecule. Whether these vanadyl ions have a biological origin and function is not known. (Author)

AD-620 495 Div. 16/3 ,16/4
RIAS INC BALTIMORE MD
PHOSPHATIDIC ACID AND GLYCERIDE SYNTHESIS BY PARTICLES FROM SPINACH LEAVES,
by George M. Cheniae. 27 Jul 64, 11p. Contract AF49 638 947 Grant ,NIH PH43 63 36 Proj. 9777 Task 977701
AFOSR , 65-1283

Unclassified report

Pub. in Plant Physiology v40 n2 p235-43 Mar

1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Plants (Botany), Metabolism), (*Microsomes, Biochemistry), (*Phosphatides, Biosynthesis), (*Lipids, Biosynthesis), Enzymes, Reaction kinetics, Adenosine phosphates, Coenzymes, Fatty acids, Phosphorus transferases, Particles, Phospholipids

The enzymic synthesis of phosphatidic acid, tri-, di-, and monoglyceride from L-alpha-glycerolphosphate-1, 3-C14 was described. On a specific activity basis a fraction from spinach leaves sedimenting at 104,000 X g had the greatest activity. Requirements for ATP, coenzyme A, fatty acid, and a divalent cation were demonstrated, thus suggesting synthesis of phosphatidic acid by the Kennedy-Kornberg pathway. Replacement of glycerolphosphate with glycerol resulted in a pronounced decrease of incorporation. Activity could be restored by addition of glycerol kinase thus indicating absence of glycerol kinase in these particles. Kinetic studies on the products indicated that phosphatidic acid was the precursor for glycerides. In addition to those products an unknown labeled phosphatide is observed. (Author)

AD-620 529 Div. 16/3
WEIZMANN INST OF SCIENCE REHOVOTH (ISRAEL)
ON THE MECHANISM OF PHOTOPHOSPHORYLATION IN CHLOROPLASTS,
by M. Avron. 01964, 12p. Contract AF EOAR64 19
AFOSR , 65-1299

Unclassified report

Pub. in Record of Chemical Progress v25 n4 p237-46 Dec 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Chloroplasts, Metabolism), (*Phosphorylation, Photochemistry), (*Photosynthesis, Phosphorylation), Phosphates, Adenosine phosphates, Esters, Exchange reactions, Oxidation, Antimetabolites, Israel

It would seem that the mechanism of utilization of electron transport energy to drive the esterification of ADP by inorganic phosphate is similar, but not identical, in oxidative and photophosphorylation. Even though the general pattern of energy conversion reactions may be similar, the difference in behavior and the differential sensitivity of the two systems to inhibitors and uncouplers most probably indicates that the actual intermediates involved are different. (Author)

AD-620 593 Div. 16/3
WEIZMANN INST OF SCIENCE REHOVOTH (ISRAEL)
IMMUNE RESPONSE TO POLYPEPTIDYL PROTEINS IN RABBITS TOLERANT TO THE PROTEIN CARRIERS,
by Isreal Schechter, Sara Bauminger, Michael Sela, David Nachtigal, and Michael Feldman. 22 Jul 64, 20p. Contract AF EOAR64 22 ,PHS C6165
AFOSR , 65-1300

Unclassified report

Pub. in Immunochemistry v1 p249-65 1964 (Copies available only to DDC users).

Descriptors: (*Immunology, Peptides), (*Peptides, Immunology), Proteins, Antigens + antibodies, Tolerances (Physiology), Serum albumin, Immune serums, Rabbits, Israel

A study was made of the immune responses to polypeptidyl proteins in rabbits which were either naturally tolerant or made experimentally unresponsive to the protein carriers. Experimentally acquired tolerance to HSA could be terminated by immunization of the unresponsive rabbits with poly-Ltyrosyl derivatives of HSA. Two parameters determined the breakdown of tolerance: (1) the chemical nature of the peptides attached: polytyrosyl HSA was effective in the termination of tolerance to HSA, whereas polyalanyl HSA was not; (2) the degree of enrichment was tyrosine. There appears to be an optimal degree of enrichment, i.e. of molecular alteration of the HSA, which will confer on the altered antigen the maximal potency to terminate tolerance: a slight alteration (3 per cent enrichment of HSA with Tyr) and a severe alteration (13 per cent enrichment) were less effective in tolerance breakdown than an intermediate degree of alteration (7 per cent enrichment with Tyr). The level of tolerance breakdown obtained by polytyrosyl HSA, as measured by the ratio of anti-HSA/anti-polytyrosyl HSA, was greater than the level obtained previously by other chemically altered antigens. The significance of this ratio was discussed in relation to the cellular basis of immunological tolerance. Antibodies were produced to the peptides per se, when attached to proteins towards which the animal is naturally tolerant (RSA), or to proteins to which the animal has acquired tolerance (HSA). In both systems, there was a similar pattern of antibody formation, which may reflect a similarity in mechanism between natural and actively acquired tolerance. (Author)

AD-620 594 Div. 16/3 ,16/4
WEIZMANN INST OF SCIENCE REHOVOTH (ISRAEL)
THE EFFECTS OF STRUCTURAL DEGRADATION ON THE COUPLED PHOTOCHEMICAL ACTIVITIES OF ISOLATED CHLOROPLASTS,
by Jonathan Gressel, and Mordhay Avron. 13 Apr 64, 11p. Contract AF EOAR64 19
AFOSR , 65-1298

Unclassified report

Pub. in Biochimica et Biophysica Acta v94 p31-41 1965 (Copies available only to DDC users).

Descriptors: (*Photosynthesis, Inhibition), (*Phosphorylation, Photochemistry), Mytochondria, Degradation, Ultrasonic radiation, Enzymes, Reduction (Chemistry), Hydrolyases, Phospholipids, Lipoproteins, Israel

Isolated washed chloroplasts were degraded by sonication or lipolytic enzymes and the inhibition of photophosphorylation coupled to photoreduction was measured. Sonication, pancreatic lipase and phospholipase A inhibited photophosphorylation to a considerably greater extent than photoreduction. The enzymes did not inhibit phenazine methosulfate-mediated phosphorylation as much as the coupled phosphorylation with ferricyanide. This differential inhibition of phosphorylation could not be accounted for by any type of ATPase activity. Wheat germ lipases, which best hydrolyze lipids with short fatty acid chains, did not affect the photoreactions. Some poorer-grade preparations were contaminated with an ATPase which could account for some uncoupling. The data support the hypothesis that, as with mitochondria, a more complex phospholipoprotein structure is necessary for the coupled reactions than for electron transport alone. (Author)

AD-620 596 Div. 16/3
OXFORD UNIV (ENGLAND) DEPT OF PHARMACOLOGY
BENZYLAMINE OXIDASE AND HISTAMINASE: PURIFICATION AND CRYSTALLIZATION OF AN ENZYME FROM PIG PLASMA,
by Franca Buffoni, and H. Blaschko. 9 Apr 64, 19p. Contract AF EOAR12 64 Proj. 9777 Task 977701
AFOSR , 65-1297

Unclassified report

Pub. in Proceedings of the Royal Society v161 (SerB) p153-67 1964 (Copies available only to DDC users).

Descriptors: (*Oxidoreductases, Purification), (*Diamine oxidase, Purification), (*Blood plasma, Enzymes), Crystallization, Chemical precipitation, Chromatographic analysis, Electrophoresis, Molecular weight, Copper, Radioactivation analysis, Amines, Decomposition, Swine, Great Britain

The enzyme benzylamine oxidase of pig plasma was purified and some of the properties of the pure preparation were studied. The purification procedure included several precipitations with ammonium sulphate and separations of proteins by column chromatography, first on DEAEcellulose, followed by DEAE-Sephadex and lastly on a hydroxy-apatite column. Crystals were prepared from solutions of the purified enzyme by adding ammonium sulphate. The crystalline preparation was homogeneous when studied by starch-gel electrophoresis and by ultracentrifugation. The molecular weight, as determined on the analytical ultracentrifuge, was 195000. The copper content of the enzyme, as determined by radioactivation analysis, was about four atoms of Cu per molecule of enzyme. Concentrated solutions of the enzyme had a pink colour; the colour disappeared when substrate (benzylamine) was added under anaerobic conditions. The amines which were tested and found to be oxidized by the pure enzyme were: benzylamine, histamine, mescaline and 4-picolylamine. The affinity of the enzyme for benzylamine was more than one hundred times that for histamine. (Author)

AD-620 624 **See Fld. 6/15**

AD-620 632 Div. 16/3
WEIZMANN INST OF SCIENCE REHOVOTH (ISRAEL)
INDUCTION OF IMMUNOLOGICAL TOLERANCE TOWARDS A PEPTIDE DETERMINANT WITH A NONIMMUNOGENIC POLYPEPTIDE.
Preliminary notes,
by Israel Schechter, Sara Bauminger, and Michael Sela. 29 Oct 64, 2p. Rept. no. PN-21057
Contract AF AFOSR22 64
AFOSR , 65-1301

Unclassified report

Pub. in Biochimica et Biophysica Acta v93 p686-7 1964 (Copies available only to DDC users).

Descriptors: (*Immunology, Peptides), (*Peptides, Immunology), Tolerances (Physiology), Antigens + antibodies, Immune serums, Serum albumin, Ribonuclease, Rabbits, Israel

AD-620 709 Div. 16/3
GOTEBORG UNIV (SWEDEN) DEPT OF PHARMACOLOGY
A METHOD FOR THE FLUOROIMETRIC DETERMINATION OF 3-METHOXYTYRAMINE IN TISSUES AND THE OCCURENCE OF THIS AMINE IN BRAIN,
by A. Carlsson, and B. Waldeck. 25 Sep 63, 8p. Contract AF EOAR14 63 Proj. 9777 Task 977701
AFOSR , 65-1292

Unclassified report

Pub. in Scandinavian Journal of Clinical and Laboratory Investigation v16 n2 p133-8 1964 (Copies available only to DDC users).

Descriptors: (*Brain, Amines), (*Amines, Fluorescence), Tissues (Biology), Separation, Ion exchange, Oxidation, Decomposition, Transferases, Sweden

A fluorimetric method for the determination of small amounts of 3-methoxytyramine, (MT), in tissues is described. After separation on ion-exchange column, MT is converted to a strongly fluorescent compound. Interference of dopamine (DA), is eliminated either by column separation or differential oxidation. MT is demonstrated in brain of some mammals indicating a role of catecholO-methyl transferase in the degradation of DA in this tissue. (Author)

AD-620 716 Div. 16/3
UNIVERSITY COLL GALWAY (EIRE)
PURIFICATION AND N-TERMINAL ANALYSES OF ALGAL BILIPROTEINS,
by P. O. Carra. 19 May 64, 6p. Contract AF61 052 409
AFOSR , 65-1282

Unclassified report

Pub. in Biochemical Journal, v94 p171-4 1965. (Copies available only to DDC users).

Descriptors: (*Algae, Proteins), (*Proteins, Molecular structure), (*Organic pigments, Molecular structure), Purification, Chemical analysis, Chromatographic analysis, Crystallization, Amino acids, Methionine, Eire

R-, B- and C-phycoerythrins and R- and C-phycocyanins were isolated and purified on a preparative scale by calcium phosphate chromatography, ammonium sulphate fractionation and crystallization. The N-terminal residues of these biliproteins were analysed. Methionine is the only N-terminal residue of all the phycoerythrins, there being about 14 N-terminal residues per molecule of Rand B-phycoerythrins (mol.wt. 290 000) and about 8 per molecule of C-phycoerythrin (mol.wt. 226 000). Threonine (1 residue) is N-terminal in C-phycocyanin (mol.wt. 138 000), and both threonine (about 1.3 residues) and methionine (5 residues) are N-terminal in R-phycocyanin (mol.wt. 273 000). Results suggest that the apoproteins of the various phycoerythrins are closely related, whereas C-phycocyanin has quite a different gross structure, and that R-phycocyanin contains two types of sub-unit, one related to C-phycocyanin and the other to the phycoerythrins. (Author)

AD-620 725 See Fld. 6/13

6/3. BIOLOGY

AD-620 199 Div. 16/4
CFSTI Prices: HC $6.00 MF $1.25
ASSOCIATION FOR THE STUDY OF ANIMAL BEHAVIOUR HARPENDEN (ENGLAND)
LEARNING AND ASSOCIATED PHENOMENA IN INVERTEBRATES.
Proceedings of a joint conference held at Cambridge, England, 7-9 Jul 64,
by W. H. Thorpe, and Demorest Davenport. 01964, 201p.

Unclassified report

Supported by ONR, NSF, and AFOSR. Pub. as Animal Behaviour (Gt. Brit.), Suppl. 1, 1964. Prepared in cooperation with the American Society of Zoologists, Section of Animal Behavior.

Descriptors: (*Invertebrates, Learning), (*Learning, Invertebrates), Adaptation (Physiology), Behavior, Paramecium, Annelida, Cephalopoda, Crustacea, Hymenoptera, Ganglia, Nerve cells, Conditioned reflex, Embryos, Biology, Symposia, Great Britain

Contents: Learning, world models and pre-adaptation; Paramecia, planaria and pseudo-learning; Studies of the behaviour of Paramecium aurelia; Behavioural studies of the coelenterate Hydra piradi; Behaviour of sessile coelenterates in relation to some conditioning experiments; Adaptive changes in cnidarians; Cannibals, chemicals and contiguity; Behaviour of planaria in instrumental learning paradigms; Learning in planarians; Learning in annelids and attempts at the chemical modification of this behaviour; Learning abilities of nereid polychaetes and the role of the supra-oesophageal ganglion; Research and theory on conditioning of annelids; Descartes, mechanistic biology and animal behaviour; Planarian learning; Learning and movement in octopuses; Discrimination learning in the octopus; Release and orientation of behaviour and the role of learning as demonstrated in crustacea; Aspects of orientation in the diggerwasp Bembix Rostrata; Electrophysiological approach to learning in isolatable ganglia; Macromolecular coding in nerve cell and embryo.

AD-620 211 Div. 16/4 ,16/1
CALIFORNIA UNIV LOS ANGELES BRAIN RESEARCH INST
A STEREOTAXIC ATLAS OF THE CHIMPANZEE BRAIN (PAN SATYRUS),
by M. R. DeLucchi, B. J. Dennis, and W. R. Adey. 01965, 159p. Contract AF AFOSR61 81 Proj. 7164 Task 716402
AFOSR , 65-1503

Unclassified report

Available from University of California Press, $15.00.

Descriptors: (*Chimpanzees, Brain), (*Brain, Chimpanzees), Physiology, Histology, Neurology, Anatomy, Morphology (Biology), Measurement

The stereotaxic atlas of the chimpanzee brain was designed to provide previously unavailable data on the deep structures of the chimpanzee brain. Extensive illustrative material provides frontal and sagittal sections, as well as a large number of drawings, all of which are accompanied by measurement scales. The greater intelligence of the chimpanzee, and the fact that the complexity of electrical activity of the chimpanzee brain approaches the complex patterns of man have made it highly desirable to be able to manipulate its deep brain system. Analyses of the effects of stimulation, ablation, and recording in the chimpanzee brain are likely to reveal information on brain organization having close relevance to human brain function in health and disease. (Author)

AD-620 240 See Fld. 6/1

AD-620 254 Div. 16/4 ,16/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
THE INFLUENCE OF VIBRATIONS ON CHROMOSOMES,
by James C. Knepton,Jr.. 12 Apr 65, 18p. Rept. no. NSAM-924

Unclassified report

Prepared in cooperation with National Aeronautics and Space Administration, Washington, D. C. Office of Biotechnology and Human Research.

Descriptors: (*Chromosomes, Vibration), (*Vibration, Chromosomes), (*Space biology, Vibration), Drosophila, Larvae, Eggs, Mutations, Neurospora, Plants (Botany), Spores, Acceleration, Cytology, Laboratory animals

The report gives the results of an initial series of experiments in which cells from various organisms were vibrated at frequencies of 40 and 70 cps with 10 and 20 G's. Microspores of Tradescantia paludosa (Clone 3 of Sax), conidia of Neurospora crassa (L-prolineless clock-mutant, FGSC No. 491a), Neurospora crassa (N.R.C. No. 865A), and ova, larvae, and pupae of Drosophila melanogaster (wild type) were studied for chromosomal rearrangements. No influence was found of these vibration frequencies and accelerations on N. crassa, T. paludosa, and the p sub 1 generation of D. melanogaster, but there was observed the presence of body color and wing shape mutants among the F sub 1 generation of D. melanogaster. In future work these organisms will be subjected to other frequencies and displacements of vibration. (Author)

AD-620 410 Div. 16/4
ARMY MEDICAL UNIT FORT DETRICK MD
SCHISTOSOMA HAEMATOBIUM IN THE CHIMPANZEEA NATURAL INFECTION,
by Alexander De Paoli. 01964, 6p.

Unclassified report

Pub. in American Journal of Tropical Medicine and Hygiene v14 n4 p561-5 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Schistosoma, Chimpanzees), (*Chimpanzees, Schistosoma), Parasitic diseases, Necrosis, Tissues (Biology), Medical examination, Histology, Infections

A natural infection of Schistosoma haematobium was diagnosed at necropsy in a young male chimpanzee (Pan satyrus). Parasitic involvement was present in the urinary bladder, rectum, lungs, liver, appendix and mesenteric venules. This is believed to be the first reported infection of S. haematobium in this species. (Author)

AD-620 426 Div. 16/4
ARMED FORCES INST OF PATHOLOGY ARMY MEDICAL CENTER WASHINGTON D C
PARAPHENYLENEDIAMINE STAINING OF OSMIUMFIXED, PLASTIC-EMBEDDED TISSUE FOR LIGHT AND PHASE MICROSCOPY.
Technical note,
by Juan F. Estable-Puig, Walter C. Bauer, and J. M. Blumberg. 01965, 5p.

Unclassified report

Pub. in Journal of Neuropathology and Experimental Neurology v24 n3 p531-5 Jul 1965. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Microscopy, Biological stains), (*Histological techniques, Coloring), (*Biological stains, Amines), Tissues (Biology), Embedding substances, Photomicrography, Aromatic compounds

A simple method is described for staining 'thick' sections of osmium-fixed plastic-embedded tissue, using an aqueous solution of paraphenylenediamine. Images of good contrast are obtained from such stained sections by light and phase micrography. (Author)

AD-620 473 See Fld. 6/1

AD-620 495 See Fld. 6/1

AD-620 499 Div. 16/4
CFSTI Prices: HC $1.00 MF $0.50
ARMY BIOLOGICAL LABS FREDERICK MD
IMMUNITY OF PIGMENTED PLANTS AND ANTIBIOTICS,
by A. F. Kapustinskii. 0 Jul 65, 14p. Rept. no. Translation-1453
TT , 65-63605

Unclassified report

Trans. of Uspekhi Sovremennoi Biologii (USSR) v29 n3 p370-8 1950.

Descriptors: (*Organic pigments, Immunology), (*Plants (Botany), Immunology), (*Antibiotics, Fungi), Anthoxanthin pigments, Immunity, Quinones, Diseases, Toxicity, USSR

The report is an attempt at a systematization and critical interpretation of the separate disconnected facts which have accumulated in literature concerning the immunity of plants and their anthocyanin pigmentation. The author's account of personal observations and investigations are presented along with the simultaneous revelation of the existence of a common biological foundation for the antibiotic effect of antocyanins from higher plants and antibiotics of fungus origin.

AD-620 514 Div. 16/4
WISCONSIN UNIV MADISON DEPT OF ZOOLOGY
PURIFICATION AND ISOLATION JUVENILE HORMONE AND ITS ACTION IN LEPIDOTERAN LARVAE,
by H. Roller, and J. S. Bjerke. 24 May 65, 9p.
Contract Nonr120214 Proj. NR108 441

Unclassified report

Pub. in Life Sciences, v4 n16 p1617-24 1965 (Copies available only to DDC users).

Descriptors: (*Lepidoptera, Hormones), Larvae, Adults, Growth, Biological assay, Tissue extracts, Purification, Chromatographic analysis

Conclusions: (1) The JH-active compound extracted from abdomina of adult male Cecropia is identi-

cal with the juvenile hormone produced by corpora allata. (2) The JHactive compound which we have isolated is the juvenile hormone. (3) Juvenile hormone is not farnesol, farnesal, farnesyl methyl ether, or any other compound previously tested for JH activity.

AD-620 519 Div. 16/4
BRITISH COLUMBIA RESEARCH COUNCIL VANCOUVER
HOST-FINDING AND REPULSION OF AEDES AEGYPTI,
by P. N. Daykin, F. E. Kellogg, and R. H. Wright. 20 Oct 64, 25p. Contract DA49 193MD2391

Unclassified report

Pub. in The Canadian Entomologist v97 n3 p239-63 Mar 1965 (Copies available only to DDC users).

Descriptors: (*Aedes, Behavior), (*Sensory perception, Aedes), Insect repellants, Chemoreceptors, Flight, Convection, Temperature, Humidity, Carbon dioxide, Mathematical analysis, Probability, Differential equations, Canada

The spontaneous activation of Aedes aegypti, and their responses to external stimuli (especially changes in temperature, humidity and carbon dioxide concentration) have been analyzed in a way that allows the controlling neural mechanisms to be inferred. In general, the flying insect turns back on leaving a favorable air stream, but does not turn on entering one. The normal attack program reduces to four basic steps: a general search initiated by a small rise in the CO2 level, no turn when the insect enters the 'host stream' (i.e., the convective or other air current whose temperature and/or relative humidity has been modified by the host), an induced turn on leaving the host stream, and a visual landing. Repellents resemble CO2 in activating previously resting mosquitoes. If, however, the host stream contains a repellent vapor, the insect is made to turn on entering the host stream and is prevented from turning on leaving it. Thus the repellent vapor reverses the normal response to the host stream in two ways that are vital to success in locating a warmblooded host. It also tends to inhibit probing. The antennal setae through which the various environmental influences are perceived can be inferred from a quantitative consideration of the responses. (Author)

AD-620 528 Div. 16/4
FLORENCE UNIV (ITALY)
RESEARCH ON THE ASTRONOMICAL ORIENTATION OF EQUATORIAL LITTORAL AMPHIPODA. I. SOLAR ORIENTATION IN ONE SOMALIAN POPULATION OF TALORCHESTER MARTENSII WEBER (RICERCHE SULL'ORIENTAMEN TO ASTRONOMICO DI ANFIPODI LITORALI DELLA ZONA EQUATORIALE. I. L'ORIENTAMENTO SOLARE IN UNA POPOLAZIONE SOMALA DI TALORCHESTIA MARTENSII WEBER),
by A. Ercolini. 24 May 64, 37p. Contract AF EOAR62 100 Proj. 9777 Task 977701 AFOSR , 65-0951

Unclassified report

Pub. in Zeitschrift fur vergleichende Physiologie v49 p138-71 1964 (Copies available only to DDC users). Text in Italian with English summary.

Descriptors: (*Crustacea, Diurnal variations), (*Photosensitivity (Biological), Crustacea), (*Rhythm (Biology), Crustacea), Aquatic animals, Plankton, Solar radiation, Navigation, Behavior

The solar orientation of Talorchestia martensii Weber was investigated. The mechanism of solar orientation shows particular time variations of its correctness, due to the local astronomic circumstances. Animals tested immediately after collection, after having been kept under a normal artificial rhythm of light-darkness, or kept segregated in continuous darkness, showed systematic differences from the correct orientation. The existence of an innate correct directional tendency is confirmed in littoral Amphipods. The behavior during the 2 periods of positive and negative solar declination is discussed and 3 hypotheses are offered in explanation. (Author)

AD-620 563 **See Fld. 7/3**

AD-620 579 **See Fld. 11/7**

AD-620 594 **See Fld. 6/1**

AD-620 600 Div. 16/4 ,16/1
LUND UNIV (SWEDEN)
ADRENERGIC NERVES TO THE EYE AND ITS ADNEXA IN RABBIT AND GUINEA-PIG,
by Berndt Ehinger. 01964, 25p. Contract AF EOAR64-5 ,PHS NB05236 01 AFOSR , 65-1296

Unclassified report

Pub. in Acta Universitatis Lundensis Sectio II n20 p1-23 1964 (Copies available only to DDC users).

Descriptors: (*Autonomic nervous system, Eye), (*Eye, Autonomic nervous system), Nerve fibers, Optic nerve, Cornea, Retina, Muscles, Cells (Biology), Glands, Visual acuity, Histological techniques, Fluorescence, Rabbits, Guinea pigs, Sweden

The distribution of adrenergic nerves to orbital and ocular structures in rabbits and in guinea-pigs was studied with the sensitive and specific fluorescence method developed by Falck. Considerable species differences were found, especially in the irido-corneal angle, which in rabbits contains few varicose adrenergic fibers (V.A.F.), but in guineapigs many. In both species, V.A.F. were found in the cornea, in the dilator and sphincter pupillae as well as in the iris stroma, at the ciliary epithelium, in the ciliary muscle, and in the chorioid. In the chorioid, distribution is densest in those parts that correspond to the areas of the retina that have the highest visual acuity. In rabbits, the vascular nerves in the iris have an unusual distribution throughout the inner part of the perivascular sheath; in some mediumsized vessels, they also reach the intimal layer. An adrenergic innervation of the smooth musculature outside the ocular bulb was found in the tarsal muscle, in the arrectores pilorum, and in that of the tarsal sebaceous glands. No V.A.F. were found around the acini of the lacrimal gland or in the optic nerve. (Author)

AD-620 628 Div. 16/4 ,30/4
BRITISH COLUMBIA RESEARCH COUNCIL VANCOUVER
A TWO-AIR-STREAM OBSERVATION CHAMBER FOR STUDYING RESPONSES OF FLYING INSECTS,
by P. N. Daykin, and F. E. Kellogg. 20 Oct 64, 6p. Contract DA49 193MD2391

Unclassified report

Pub. in The Canadian Entomologist v97 n3 p264-8 Mar 1965 (Copies available only to DDC users).

Descriptors: (*Insects, Flight), (*Laboratory equipment, Biological laboratories), Aedes, Controlled atmospheres, Turbulent boundary layer, Heat exchangers, Expanded plastics, Convection, Sensory perception, Vision, Adaptation (Physiology)

The paper describes an observation chamber and airconditioning system designed for studying the responses of flying insects at the boundary between two microclimates. Two vertical air streams each fill one half of the rectangular observation chamber. Turbulence is carefully removed so as to maintain a sharp boundary between the streams. Each stream is separately conditioned by passage through heat exchangers and plastic sponges impregnated with substances to be vapourized. Responses of flying insects are studied both photographically and by counting rates of turning at the boundary. (Author)

AD-620 670 Div. 16/4
CFSTI Prices: HC $1.00 MF $0.50
NAVAL ORDNANCE TEST STATION CHINA LAKE CALIF
TRAINING AND OPEN RELEASE OF AN ATLANTIC BOTTLENOSE PORPOISE TURSIOPS TRUNCATUS (MONTAGU).
Research rept.,
by R. E. Bailey. 0 Jul 65, 23p. Rept. no. NOTS-TP-3838
Task R360FR106 216 1R011 01 01

Unclassified report

Descriptors: (*Cetacea, Training), Adaptation (Physiology), Auditory signals, Conditioned reflex, Hearing, Behavior, Noise, Control, Oceans, Tests

A female Atlantic bottlenose porpoise, Tursiops truncatus (Montagu), was adapted to wearing a harness and conditioned to seek out a device emitting an acoustic signal. This response was reliably elicited in situations unusual to the animal and over distances in excess of 400 meters. The program was climaxed by tests in the open ocean. Standard techniques of operant conditioning were employed. Factors affecting animal reliability and control are discussed. (Author)

AD-620 701 Div. 16/4 ,16/14
CFSTI Prices: HC $1.00 MF $0.50
MARYLAND UNIV COLLEGE PARK DEPT OF ZOOLOGY
CURRENT REFERENCES IN MEDICAL ENTOMOLOGY FROM RUSSIAN, CENTRAL AND EASTERN EUROPEAN AND CHINESE LITERATURE. VOLUME IV, NO. 8,
by George Anastos. 01965, 19p. Contract DA49 193MD2238

Unclassified report

Descriptors: (*Insects, Bibliographies), (*Disease vectors, Bibliographies), Ticks, Diptera, Siphonaptera, Mites, Lice, Rickettsia, Parasites, Veterinary medicine, Ecology, Epidemiology, USSR, Eastern Europe, China

AD-620 704 **See Fld. 6/5**

AD-620 710 Div. 16/4
COLORADO UNIV BOULDER
HUBBSIA, A NEW GENUS OF ROCCELLACEAE (LICHENIZED FUNGI) FROM MEXICO,
by William A. Weber. 01964, 8p. Contract NSF GB1538

Unclassified report

Pub. in Svensk Botanisk Tidskaift v59 n1 p59-64 1965. (Copies available only to DDC users).

Descriptors: (*Lichens, Morphology (Biology)), (*Fungi, Morphology (Biology)), California

AD-620 725 **See Fld. 6/13**

AD-620 756 Div. 16/4
CFSTI Prices: HC $1.00 MF $0.50
YALE UNIV NEW HAVEN CONN DEPT OF BIOLOGY
POLARIZED LIGHT AND THE FUNCTIONAL ORGANIZATION OF THE COMPOUND EYE.
Final rept.,
by Talbot H. Waterman. 01965, 14p. Contract Nonr60923 ,Nonr57100

Unclassified report

Descriptors: (*Eye, Arthropods), (*Arthropods, Eye), Crustacea, Cephalopoda, Aquatic animals, Light, Polarization, Underwater, Illumination, Optical images, Cornea, Nerve cells, Nerve fibers, Growth, Behavior, Sensitivity

The long range aim of this research program was

to investigate the mechanism and biological significance of the polarized light sensitivity of arthropods first demonstrated in the honey-bee by Karl von Frisch in 1948. The operational objectives of the work naturally developed in ways which were not completely anticipated at the beginning so that three related, yet distinct, lines of research were in fact pursued under the subject contract. Their objectives were (1) electrophysiological study of arthropod compound eyes with particular reference to their sensitivity to plane polarized light, (2) measurement of polarization of natural submarine light as well as the factors which affect it and (3) analysis of polarized light orientation (polarotaxis) in aquatic animals both in the laboratory and in the field.

AD-620 781 Div. 16/4
CALIFORNIA UNIV OAKLAND NAVAL BIOLOGICAL LAB
PECULARITIES OF OVINE CELLS IN CULTURE,
by Walter A. Nelson-Rees, Alexis J. Kniazeff, and Norman B. Darby Jr., 27 Aug 64, 12p. Contract PHS PH43 63 13

Unclassified report

Pub. in Chromosoma v16 n1 p79-89 1965 (Copies available only to DDC users).

Descriptors: (*Tissue culture cells, Mammals), (*Chromosomes, Tissue culture cells), (*Mammals, Chromosomes), Kidneys, Cells (Biology), Genetics, Sex, Bovines

The chromosome complement of two ovine (Ovis aries L.) kidney cell lines are described. Nuclei of MDOK, the older cell line, are generally larger than those of OK cells, they are hypo-tetraploid and show considerable chromosomal irregularities both in structure and behavior. The OK line observed since its initiation, is now hyper-diploid and exhibits a gradual accumulation of chromosomes. Both cell lines have in common the fact that they now maintain a larger proportion of chromosomes with interstitial centromeres than telocentric chromosomes. This observation parallels similar ones made earlier in bovine cells. However, the processes whereby this condition arose in the respective cultures are believed to be different and are discussed. (Author)

6/5. CLINICAL MEDICINE

AD-620 156 See Fld. 6/12

AD-620 401 Div. 16/5
CFSTI Prices: HC $2.00 MF $0.50
OHIO STATE UNIV COLUMBUS
THE ABSENCE OF MICROORGANISMS IN INFLAMED GINGIVAE.
Master's thesis,
by Dale F. P. Rank, 01965, 30p. Contract AF33 608 1095

Unclassified report

Descriptors: (*Mouth, Diseases), (*Microorganisms, Mouth), Tissues (Biology), Connective tissue, Toxins + antitoxins, Dentistry, Histological techniques, Etiology

Microorganisms have been considered for many years as an important etiological factor in inflammatory periodontal disease. The prevailing view is that microorganisms do not invade the living gingival tissues, but damage the tissues by the action of their toxins or enzymes. In this study, microorganisms were not observed to have invaded viable gingival tissues. The microorganisms were seen on the incised surface, on the oral and crevicular epithelial surfaces, and on ulcerated surfaces. Ulceration of the epithelial surfaces was not a notable feature of inflamed gingivae since only two interdental papillae were ulcerated, and the crevicular epithelium was intact in all specimens. The presence or absence of an inflammatory infiltrate could not be determined clinically. Both clinically diseased and healthy control tissue biopsies demonstrated variable amounts of inflammatory infiltrate in the connective tissues. Lymphocytes, or lymphocytelike cells, were present between epithelial cells in varying numbers.

AD-620 402 Div. 16/5
CFSTI Prices: HC $2.00 MF $0.50
OHIO STATE UNIV COLUMBUS
THE EFFECT OF PALATAL COVERAGE ON TASTE PERCEPTION.
Master's thesis,
by William M. Harrison, 01965, 45p. Contract AF33 608 1095

Unclassified report

Original copy contains color other than black and white. Reproductions will be made in black and white only.

Descriptors: (*Prosthetics, Dentistry), (*Taste, Thresholds (Physiology)), Teeth, Food, Sodium compounds, Chlorides, Acrylic resins, Cobalt alloys, Chromium alloys, Gold alloys, Cranial nerves

The results of this research lead to the following conclusions for these two subjects when using sodium chloride as a taste stimulus. 1. Palatal coverage has no significant physiologic effect on taste perception. 2. The reproduction of palatal rugae on a dental prosthesis has no detectable effect on taste perception. 3. Acrylic resin, cobalt-chromium or gold alloys do not have any detectable influence on taste. 4. Test subjects with stabilized taste thresholds for sodium chloride in solution can demonstrate the same degree of stability using a properly prepared test food. 5. The test food did not require sufficient mastication to test the effect of vigorous mastication on taste. (Author)

AD-620 409 See Fld. 6/16

AD-620 414 See Fld. 6/16

AD-620 415 Div. 16/13,16/10
ARMED FORCES INST OF PATHOLOGY ARMY MEDICAL CENTER WASHINGTON D C
DISLOCATION OF THE RADIAL HEAD IN THE NEWBORN INFANT. CASE REPORT AND REVIEW OF THE LITERATURE,
by James J. Schubert, 01964, 6p.

Unclassified report

Pub. in The Journal of Bone and Joint Surgery v47-A n5 p1019-1023 Jul 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Infants, Joints (Physiology)), (*Joints (Physiology), Arms), Bone, X rays, Birth, Anomalies, Musculoskeletal system, Medicine, Surgery

A case report of a dislocation of the radial head in a newborn infant following a traumatic breech delivery is presented. Immediate closed reduction and immobilization in a position of complete supination and extension for two and one-half weeks resulted in a normally functioning elbow at the age of fifteen months. Slight retardation of the secondary ossification center of the capitellum was noted, but otherwise the extremity appeared to be growing normally. Prompt recognition and treatment are believed to be essential for normal growth and function of the elbow. (Author)

AD-620 422 Div. 16/5,16/10
CFSTI Prices: HC $6.00 MF $1.25
INDIANA UNIV INDIANAPOLIS SCHOOL OF DENTISTRY
THE GIANT-CELL OF REPARATIVE GRANULOMAS: A REVIEW OF THE LITERATURE AND ANALYSIS OF 146 CASES.
Master's thesis,
by James K. Jacoby, 01965, 213p. Contract AF33 608 1070

Unclassified report

Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only.

Descriptors: (*Dentistry, Neoplasms), (*Neoplasms, Bone), (*Histology, Neoplasms), Etiology, Pathology, Cytology, Cells (Biology), Mitosis, Tissue culture, Histological techniques, Enzymes, Labeled substances, Connective tissue, X rays, Head, Morphology (Biology), Reticuloendothelial system

An attempt was made to understand the nature of the giant-cell reparative granuloma and its natural history from a study of 146 biopsy specimens and case histories. A survey of the clinical features, the histopathology and histochemical enzyme determinations on selected cases suggests that the lesion is in the nature of a hyperplastic tissue response, primarily fibrogenic or fibrovascular in character and arising primarily from the periodontal ligament and periosteum of the jaws. The lesional giant cells were indistinguishable both morphologically and histochemically from osteoclasts and, save for their relationship to bone, are considered to be essentially the same cell type. Study of the site, age, and sex incidence suggests that the shedding of the deciduous dentition may be a common etiological factor common to both sexes and an attempt has been made to relate this, at least in some instances, to the 'absorbent organ of Tomes'. Predominance of lesions in females throughout the child-bearing age suggests that an endocrine effect on tissue response may be an important etiologic factor. (Author)

AD-620 626 Div. 16/5
SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TEX DEPT OF DENTAL SCIENCE
CONTROL OF POSTOPERATIVE SEQUELAE IN IMPACTED THIRD MOLAR SURGERY,
by Lucian Szmyd, Ira L. Shannon, and Alex M. Mohnac, 01965, 6p.

Unclassified report

Pub. in Journal of Oral Therapeutics and Pharmacology v1 n5 p491-6 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Teeth, Surgery), (*Dentistry, Surgery), (*Surgery, Dentistry), Pain, Anesthetics, Therapy

The problem of controlling postoperative pain is acute at approximately three to eight hours following the injection of the local anesthetic. In the unpremedicated patient, the prescription of strong analgesic agents to provide maximum pain control during this critical period will usually be indicated in all but the patients classified as 'easy' impactions. Postoperative pain and trismus appear to be closely related. Control of postoperative pain will usually aid in the control of postoperative trismus. Swelling frequently reaches its peak at approximately 36 hours postoperatively. The value of ice applications in the control of postoperative swelling is debatable. Surgical difficulty and postoperative pain experience are related when dealing with 'difficult' versus 'easy' impactions. Approximately 25% of patients with easy impactions will experience moderate or severe pain within three hours following surgery when postoperative care is withheld. This figure rises to 50% of the patients with impactions classified as 'difficult.' Adequate intravenous premedication obviates the need for routine prescription of narcotics to control postoperative pain. Only 23% of patients with intravenous premedication experienced postoperative pain of a degree to warrant the use of strong analgesic agents. Objective determinations of serum free 17-hydroxycorticosteroid levels indicate that stress in impaction surgery is related to surgical difficulty and that the patient's response can be beneficially affected by an intensive regimen of postoperative care. (Author)

AD-620 645 See Fld. 6/12

AD-620 704 Div. 16/13,16/11,16/10,16/4
NEW YORK MEDICAL COLL N Y

THE USE OF D-L ETHIONINE IN THE TRANSPLANTATION OF PANCREATIC TISSUE IN HAMSTERS,
by E. L. House, B. Pansky, M. S. Jacobs, R. Strebel, and H. Payan. 01964, 5p. Contract Nonr275401

Unclassified report

Pub. in The Anatomical Record, v152 n2 p211-5 Jun 1965. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Transplantation, Pancreas), (*Pancreas, Transplantation), Amino acids, Corticosteroid agents, Histology, Growth, Hamsters

In order to eliminate the adverse effects of the secretion of the exocrine tissue on the islets in the pancreatic transplants the hosts were injected with D-L ethionine. Twenty-six male hamsters were divided into two groups. All animals received subcutaneously 1 mg per gram of body weight per day of a 5% aqueous solution of ethionine. In addition, each received 3 mg of cortisone (25 mg per ml) two days before transplant and 1 mg on the fifth and twelfth post-transplant days. In group I, the ethionine was begun seven days before transplant and was continued for six days after neonatal pancreas was placed in the cheek pouches of the hosts. In group II, ethionine was started on the day of transplantation and was continued for 13 days. Growth and differentiating were checked for up to 56 days. Growth in both groups was comparable to that in animals receiving cortisone alone. Histological examination revealed neither cyst formation nor interstitial secretion leakage in any of the ethionine animals. In both groups, the differentiation of islets was far superior to that found in untreated hamsters, with 85% of the hosts in group I and 55% of those in group II showing islets. (Author)

6/8. FOOD

AD-620 574 Div. 29/2
CFSTI Prices: HC $1.00 MF $0.50
AMERICAN MEAT INST FOUNDATION CHICAGO ILL
FLAVOR PRECURSORS IN MEAT.
Final rept. for Oct 62-Oct 63,
by W. A. Landmann, O. F. Batzer, and A. T. Santoro. 0 Sep 65, 18p. Contract DA19 129AMC2114X Proj. 7X84 06 033 ANL, FD-21

Unclassified report

Descriptors: (*Military rations, Acceptability), (*Beef, Chemical analysis), Taste, Odors, Muscles, Tissues (Biology), Chromatographic analysis, Amino acids, Phosphates, Glycoproteins, Saccharide phosphates, Peptides

The report describes investigations of the precursor substances in beef muscle tissue which produce the desirable odors and flavors of cooked beef, in order to identify them and to elucidate the mechanism by which flavor is produced. In earlier work, results showed that the dialyzable portion of a water extract of ground beef contained material which, when heated in fat, produced a 'broiled steak' odor, and when boiled in water, produced a beef broth flavor and odor. The type of material involved in this fraction included polypeptides, glucose, phosphates and inosinic acid. The amino acid composition of the flavor fraction has been determined. Attempts to separate the phosphates for identification were unsuccessful because the isolated phosphate material could not be adsorbed on a Dowex-1 C1- column, even when the pH of the adsorbing solution was adjusted to 9.5. Work with paper chromatography indicated that the phosphates were not glucose-1phosphate or glucose-6-phosphate. Improved separation of the flavor constituents on SE-sephadex C-25 resulted in a more concentrated fraction of the odor producing material. This fraction produced a strong odor, but a subsequent amino acid analysis indicated that its amino acid content was greatly decreased, in relation to previous fractions. Work must be continued to determine the chemical nature of the fraction obtained from SE-Sephadex C-25 resin. (Author)

AD-620 575 Div. 29/2 ,20/3
CFSTI Prices: HC $1.00 MF $0.50
AMERICAN MEAT INST FOUNDATION CHICAGO ILL
A STUDY OF CHEMICAL CHANGES PRODUCED BY HEAT AND BY IRRADIATION OF MEAT AND MEAT FRACTIONS.
Final rept.,
by W. A. Landmann. 0 Sep 65, 17p. Contract DA19 129QM1972 Proj. 7 84 01 002 ANL, FD-22

Unclassified report

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Descriptors: (*Meat, Radiation effects), (*Beef, Muscles), Heat, Odors, Phospholipids, Irradiated foods, Chemical reactions, Chemical analysis, Chromatographic analysis, Infrared spectroscopy, Oxidation, Identification, Hydrogen peroxide

The experiments are attempts at identification of the precursor material which gives rise to a specific irradiation odor in beef muscle tissue when subjected to a sterilizing radiation dose (5 megarad). Early work (PB-163 598) indicated that this irradiation odor was associated with the phospholipid fraction of irradiated meat. Experiments using Thin Layer Chromatography, infra-red analysis, and chemical tests, indicate that sphingomyelin or some similar compound could be the precursor material. Efforts to identify the odor by use of infra-red analysis, gas chromatography, and chemical tests were unsuccessful. Efforts to reproduce the odor by peroxide oxidation or ozonolysis of sphingomyelin were successful except that other odors were produced in much greater intensities. Irradiation of sphingomyelin and sphingosine sulfate did not produce the irradiation odor but the possibility of a sphingomyelin containing a specific fatty acid linked through the amid nitrogen should not be overlooked as the source of irradiation odor. (Author)

AD-620 675 Div. 29/2
CFSTI Prices: HC $2.00 MF $0.50
OREGON STATE UNIV CORVALLIS DEPT OF FOOD SCIENCE AND TECHNOLOGY
DEVELOPMENT OF IRRADIATION STERILIZED SHELF-STABLE FISH AND SEAFOOD PRODUCTS.
Technical rept. for Jan 59-Jun 63,
by H. W. Schultz, R. O. Sinnhuber, T. C. Yu, and M. Landers. 0 Aug 65, 33p. Contract DA19 129QM1356 Proj. 7 84 01 002 USA-NLABS, FD-16

Unclassified report

Descriptors: (*Irradiated foods, Fishes), (*Fishes, Irradiated foods), Acceptability, Preparation, Storage, Enzymes, Antioxidants, Condiments, Taste, Chemical analysis

Results of a series of experiments have led to the development of five (prefried and enzyme-inactivated codfish patties, prefried and enzyme-inactivated halibut patties, and halibut steak) radiation sterilized (4.5 Mrad) seafood products. Large consumer panels judged these products acceptable initially, shortly after irradiation, and after 6 months storage at 21C. The study included investigation of a large number of variables including (1) thirty commercial brands of breaded seafood products, (2) enzyme-inactivation technique, (3) a large variety of breadings and batter, and binders, (4) methods of preparing the various types of patties, (5) effects of several different anti-browning and antioxidizing agents, and (6) effects of seasoning and flavor intensifying agents. Both subjective and objective analytical techniques were used for determining the effects of the various factors on acceptability and stability of the products. (Author)

AD-620 742 Div. 29/2
CFSTI Prices: HC $3.00 MF $0.75
EVANS RESEARCH AND DEVELOPMENT CORP NEW YORK
STUDY OF THE APPLICATION OF RELATIVE HUMIDITY AND MOISTURE VAPOR PRESSURE MEASUREMENTS FOR THE DETERMINATION OF THE MOISTURE CONTENT OF DEHYDRATED FOODS.
Final rept. for 15 Feb 63-15 Feb 64,
by Abraham Block, Frank E. Ellison, and Eric Hewitt. 0 Aug 65, 58p. Contract DA19 129AMC55N Proj. 7X84 06 033 ANL, FD-19

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Dehydrated foods, Moisture), (*Moisture, Determination), Humidity, Vapor pressure, Manometers, Hygrometers, Electrical equipment, Milk, Vegetables, Seafood, Birds

A comparative study was conducted of the manometric and the equilibrium electrical hygrometric techniques for using the relative humidity-moisture content relationships of dehydrated foods for rapidly and conveniently determining their moisture contents. The foods used in the study were dehydrated cabbage, nonfat milk, red bell peppers, potatoes, rice, chicken, shrimp, mixed fruit, peaches and apples. The electrical hygrometric technique was found to be somewhat more convenient than the manometric technique. The deviation of the moisture content values of the food samples as determined by these techniques from their vacuum oven moisture content values was generally about 0.1 percent moisture content. (Author)

6/9. HYGIENE AND SANITATION

AD-620 268 Div. 16/6 ,18/1 ,16/11
CFSTI Prices: HC $2.00 MF $0.50
PUBLIC HEALTH SERVICE DIV OF HEALTH MOBILIZATION WASHINGTON D C
ORIENTATION MANUAL ON DISASTER PREPAREDNESS FOR PHARMACISTS.
Final rept.
0 Aug 65, 33p. Contract OCD PS63 65 Task 2424D

Unclassified report

Prepared in cooperation with the American Pharmaceutical Association's Committee on Disaster and National Security, Washington, D. C.

Descriptors: (*Disasters, Medical personnel), (*Medical personnel, Disasters), (*Civil defense personnel, Medical personnel), Pharmacology, Professional personnel, Civil defense systems, Casualties, Shelters, Medical supplies, Drugs, Storage, Distribution, Communicable diseases, Public health, Medical laboratories, X rays, Nuclear warfare casualties, United States Government

The manual is based on 'The Role of the Pharmacist in National Disaster', prepared by the American Pharmaceutical Association's Committee on Disaster and National Security in cooperation with the Division of Health Mobilization, Public Health Service, Department of Health, Education, and Welfare. It further serves as a guide for the pharmacist in his area of responsibility for disaster preparedness. This includes an explanation of existing governmental and non-governmental programs concerning disaster preparedness services and offers direction for motivating pharmacists towards community preparedness. Appropriate reference sources are listed. (Author)

6/12. MEDICAL AND HOSPITAL EQUIPMENT AND SUPPLIES

AD-620 148 Div. 16/8 ,24/2
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA

ELECTRONIC RADIOGRAPHY BY TRANSMISSION USING RADIOACTIVE MONOLAYERS.
Research rept..
by Dietrich E. Beischer. 15 May 50. 8p.
NAVMED . NM-001-059.16.02
Unclassified report

Descriptors: (*Radiographic film. Electron bombardment). Radiography. Alpha particles. Monomolecular films. Medical equipment

A new method of radiography is described. By means of homogeneous radioactive sources - monolayers radiographs by transmission in alpha, beta or gamma light can be obtained. In special cases this method will replace the application of expensive machines. (Author)

AD-620 156 Div. 16/8 ,16/7 ,4/2
CFSTI Prices: HC $3.00 MF $0.75
NAVAL RESEARCH LAB WASHINGTON D C
ADHESIVE RESTORATIVE DENTAL MATERIALS. A LITERATURE SURVEY OF INORGANIC POLYMERS.
Final rept..
by D. L. Venezky. 28 Jul 65. 81p. Rept. no. NRL-6294
Unclassified report

Descriptors: (*Inorganic polymers. Teeth). (*Dentistry. Inorganic polymers). Adhesives. Toxicity. Stability. Chemical properties. Mechanical properties. Molecular structure. Reviews. Polymerization. Siloxanes. Boron compounds. Phosphorus compounds. Nitrogen compounds

A new adhesive restorative dental material must meet rigid requirements. These must be kept in mind in screening inorganic polymer systems reported in the literature; but since the available literature data are limited, only three requirements-toxicity, chemical stability, and ease of manipulation-were used in this evaluation. The problem was approached by considering polymers according to the group number of the elements contained in the polymer backbone. The inorganic polymers were in turn grouped into three classes: Class 1, polymers having only one element in the polymer backbone; Class 2, polymers having two different elements in the backbone; and Class 3, polymers having three or more different elements in the backbone. Inorganic polymer systems which appear most promising for use as dental materials are the Class 2 polymers containing linear silicon-oxygen backbones and Class 2 polymers containing boron-phosphorus or phosphorusnitrogen ring systems as moieties in the backbone. (Author)

AD-620 252 Div. 16/8 ,16/1 ,30/2
CFSTI Prices: HC $3.00 MF $0.75
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
A DATA PROCESSING SYSTEM FOR THE BALLISTOCARDIOGRAM,
by Robert L. Morse. 23 Feb 65. 57p. Rept. no. NSAM-915
NAVMED . MR005.13-7004.6-12
Unclassified report

Descriptors: (*Ballistocardiography. Mathematical models). (*Data processing systems. Ballistocardiography). Analog-to-digital converters. Pulse rate. Arteries. Cardiovascular system. Digital computers. Elasticity. Medical equipment. Velocity. Acceleration. Punched cards

The ballistocardiogram (BCG) is a measurement of cardiovascular function, yet the interpretation of the ballistocardiographic tracing in terms of meaningful physiological parameters has been difficult. However, the use of data processing facilities with a mathematical model of the BCG provides just such an interpretation. Appropriate processing of the BCG provides an estimate of arterial elasticity, pulse wave velocity, intra-arterial pulse wave form, and correct ordinates of the acceleration, velocity, and displacement ballistocardiogram. Furthermore, improvement in the accuracy of these measurements is likely with further development of the BCG model. (Author)

AD-620 271 Div. 16/8
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
INDOCTRINATION IN USE OF THE REBREATHING APPARATUS, MULTI-PURPOSE (RAMP).
Research rept..
by Arthur L. Hall. 5 Dec 56. 12p. Proj. NM001 106 103
NAVMED . NM-001-106-103-3
Unclassified report

Descriptors: (*Breathing apparatus. Operation). (*Training. Breathing apparatus). Air-sea rescues. Tolerances (Physiology). Feasibility studies. Hatches. Underwater equipment

Twenty naive male subjects were indoctrinated in use of the Rebreathing Apparatus, Multi-Purpose (RAMP) in shallow fresh water. Indoctrination was completed with all personnel. Breathing pressures, CO2, and O2 levels were tolerable in all cases. Possible use of the RAMP for damage control was investigated by having a 182-pound subject go aboard destroyer and carrier (CVL) type ships, and attempt passage through normal vertical and horizontal hatches while wearing the RAMP. All normal openings could be traversed, but certain of the escape scuttles would not allow passage. (Author)

AD-620 369 Div. 16/8
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
EVALUATION OF THE N.I.H. MIDGET PHOTOMETER FOR THE ESTIMATION OF CARBOXYHEMOGLOBIN.
Research rept..
by J. L. Lilienthal Jr.. 29 Jun 45. 11p.
NAVMED . X-555 (Av-285-s)-2
Unclassified report

Descriptors: (*Hemoglobin. Measurement). (*Photometers. Effectiveness). Medical equipment. Calibration. Tests

The NIH Midget Photometer was calibrated and tested for accuracy in the estimation of carboxyhemoglobin. In 13 samples of blood the analytic discrepancies between photometric and gasometric methods vaired from + 1.6 to -3.6 per cent COHb; the mean deviation was 1.3 per cent. (Author)

AD-620 455 Div. 16/8
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
EVALUATION OF A MODIFIED VERHOEFF STEREOPTER.
Research rept..
by Jorma I. Niven, Woodbury Johnson, George W. Rand, and William A. Pettit. 1 Aug 52. 12p. Proj. NM001 057.09.01
Unclassified report

Descriptors: (*Space perception. Tests). Aviation medicine. Medical equipment. Measurement. Reliability. Naval personnel. Test equipment. Tables

The Verhoeff Test of Depth Perception was administered on each of two occasions to 100 patients and volunteers at the Eye Clinic of the U. S. Naval School of Aviation Medicine. On each occasion two forms of the test were used: the standard instrument held in the hand of the tester, and a modified apparatus mounted in a rigid framework. Test-retest reliability of the standard form was 0.75 and of the modified form 0.80. Neither form showed a marked superiority over the other. (Author)

AD-620 645 Div. 16/8 ,16/7
MICHIGAN UNIV ANN ARBOR SCHOOL OF DENTISTRY
INFLUENCE OF INVESTMENTS AND DUPLICATING PROCEDURES ON THE ACCURACY OF PARTIAL DENTURE CASTINGS,
by E. R. Dootz, R. G. Graig, and F. A. Peyton. 01965. 12p. Contract DA49 007MD938
Unclassified report

Pub. in Journal of Prosthetic Dentistry, St. Louis, v15 n4 p679-90 Jul-Aug 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Teeth, Prosthetics). (*Prosthetics, Teeth). Manufacturing methods. Silicates. Bonding. Refractory materials. Sulfates. Calcium compounds. Compressive properties. Phosphates. Dentistry

The total compensating expansion of several partial denture casting investments was determined by a new method that allowed the casting of a partial denture framework on the specimen being evaluated. The accuracy of the resulting casting was then compared to the total compensating expansion of the investment used to make the casting. The effects of changing duplicating materials, soaking refractory casts in water, applying the paint-on layer and outer layer of investment on casting accuracy were determined. Also, the compressive strength at the casting temperature of several investments was determined in an effort to correlate the strength of investments with the accuracy of casting. (Author)

6/13. MICROBIOLOGY

AD-620 134 Div. 16/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
BIOLOGICAL PROPERTIES OF THE NIIEG TULAREMIA VACCINAL STRAINS,
by L. V. Sirotyuk. 25 Jun 65. 10p. Rept. no. FTD-TT-65-735
TT . 65-63352
Unclassified report

Unedited rough draft trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (USSR) v41 n10 p116-20 1964.

Descriptors: (*Pasteurella, Vaccines). (*Vaccines, Preservation). Immunity. Viability. Storage. Biology. Mice. Guinea pigs. USSR

A study was made of the biological properties of the NIIEG tularemia vaccinal strains Nos. 10, 33, and 53 as compared to the standard Gaisky's No. 15 vaccinal strain. The properties of the NIIEG strain showed no change after a 10-year storage in dried condition without any transfers. Strains Nos. 10 and 53 are harmless for guinea pigs and are highly immunogenic. Strain No. 53 possesses a reduced immunogenicity. The author recommends strain Nos. 10 and 53 as a reserve for the production of dry live tularemia vaccine. (Author)

AD-620 224 Div. 16/2 ,3/1
CFSTI Prices: HC $2.00 MF $0.50
GENERAL ELECTRIC CO ITHACA N Y ELECTRONICS LAB
RESEARCH PROGRAMS FOR ALERTING, DETECTION, AND IDENTIFICATION OF PATHOGENS.
Status rept. for 1 Oct 64-31 Mar 65,
by J. R. Gould. 31 Mar 65. 28p. Contract AF49 638 1418
AFOSR . 65-1284
Unclassified report

Descriptors: (*Bacteria. Chromatographic analysis). (*Biological warfare agents. Detection). Metabolism. Biologial products. Culture medium. Separation. Sensitivity

The purpose of the program is to assess the feasibility of detecting bacteria by an investigation of their unique metabolic activities. The following investigations were conducted: (1) metabolic pro-

ducts from growth media; (2) metabolic products from resting cell suspensions; (3) extraction procedures for metabolic products; (4) gas chromatographic techniques; and (5) sensitivity of product detection. On the basis of present results, it is believed that the technique of gas chromatography is very promising not only for the detection of metabolic differences among different genera and species, but also among strains of a species.

AD-620 438 Div. 16/2 ,16/10
CFSTI Prices: HC $2.00 MF $0.50
TEXAS A AND M UNIV COLLEGE STATION
ABSORPTION OF INTRADERMALLY INJECTED HORSE GAMMA GLOBULIN, A FOREIGN PROTEIN, IN RABBITS FOLLOWING WHOLE BODY GAMMA IRRADIATION.
Master's thesis,
by William Harold Pryor Jr.. 0 Aug 65, 43p.
Contract AF33 608 1120

Unclassified report

Descriptors: (*Whole body irradiation, Gamma globulin), (*Gamma globulin, Whole body irradiation), Radiation effects, Gamma rays, Blood analysis, Proteins, Bacteria, Antigens + antibodies, Immunology, Radiological dosage, Electrophoresis, Enzymes, Immune serums, Absorption (Biological), Diagnosis, Rabbits

Groups of rabbits were exposed to whole body gamma radiation. Twenty-four hours later a foreign protein, horse gamma globulin, was injected intradermally. Blood samples were taken at 2, 4, 6, 8, 16, and 24 hours postinjection and analyzed for presence of the foreign protein by antigen-antibody double diffusion in agar techniques. An increased quantity of horse gamma globulin would indicate reduced protein localization in situ. One group of animals (200 R) at one sample time (24 hours) showed a statistically significant increase over the control group. It is logically assumed that many radiation effects have a bearing on the amount of horse gamma globulin in the circulating blood, such as peripheral blood flow, hemoconcentration, and the status of various proteolytic enzymes. Therefore, the amount of foreign protein in the blood sample is not a direct measurement of localization capacity, unless these other effects are slight, as at low levels (200 R) and do not overshadow the localization phenomenon. The results of this study indicated that the hypothesis of a direct relationship between whole body gamma irradiation and localizing capacity of rabbits appears to be correct for a total dose level of 200 R when a 24-hour blood sample is considered. At other dose levels and sampling times, other radiation effects apparently obscure the localizing phenomenon. (Author)

AD-620 445 Div. 16/2
ARMY MEDICAL UNIT FORT DETRICK MD
EXPERIMENTAL INFECTION OF DOGS WITH TWO STRAINS OF VENEZUELAN EQUINE ENCEPHALOMYELITIS VIRUS,
by L. E. Taber, A. L. Hogge Jr., and R. W. McKinney. 01965, 6p.

Unclassified report

Pub. in American Journal of Tropical Medicine and Hygiene v14 n4 p647-51 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Venezuelan equine encephalomyelitis virus, Dogs), Infections, Immunity, Antigens + antibodies

Dogs infected with unmodified VEE developed fever, viremia, and leukopenia. Seven of the dogs infected failed to manifest frank clinical signs of illness. The remaining three dogs became somewhat aggressive toward the other dogs and less receptive to handling; no other frank signs of illness were observed. The infection was fatal for two of the three. Microscopic examination of the brains of these two animals failed to reveal evidence of encephalitis even though virus was recovered. The attenuated strain caused an inapparent infection detectable only by serologic methods. The infection resulted in immunity to subsequent challenge with unmodified virus. (Author)

AD-620 446 Div. 16/2 ,16/10
WALTER REED ARMY INST OF RESEARCH WASHINGTON D C DEPT OF HEMATOLOGY
HEMORRHAGIC DISEASE IN RODENTS CAUSED BY CHIKUNGUNYA VIRUS. I. STUDIES OF HEMOSTASIS,
by Harvey J. Weiss, Scott B. Halstead, and Sudie B. Russ. 25 Feb 65, 6p.

Unclassified report

Pub. in Proceedings of the Society for Experimental Biology and Medicine v119 p427-32 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Chikungunya virus, Hemorrhage), Diseases, Rodents, Blood platelets, Blood diseases, Blood coagulation, Prothrombin, Corticosteroid agents, Antibiotics, Heparin, Thailand

Suckling mice and rats develop a hemorrhagic syndrome when infected with a low mouse passage strain of Thailand chikungunya virus. Studies of hemostasis revealed thrombocytopenia, prolonged bleeding time, prolonged clotting time and decrease in prothrombin time and factor V and factors VII + X. Attempts to modify the occurrence of hemorrhage by pretreatment with corticosteroids or antibiotics were unsuccessful. Animals treated with heparin appeared to be somewhat protected against hemorrhage but not death. (Author)

AD-620 497 Div. 16/2
CFSTI Prices: HC $1.00 MF $0.50
ARMY BIOLOGICAL LABS FREDERICK MD
EVALUATION OF THE VIRULENCE AND IMMUNOGENICITY OF VACCINE STRAINS OF SALMONELLA AND SHIGELLA BY DETERMINING THE MEAN (50%) DOSES (LD50),
by E. N. Milikova, and I. G. Vasileva. 0 Jun 65, 13p. Rept. no. translation-1403
TT , 65-63603

Unclassified report

Trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (USSR) v40 n1 p92-8 1963.

Descriptors: (*Vaccines, Enterobacteriaceae), (*Shigella, Vaccines), (*Salmonella, Vaccines), Dosage, Immunity, Culture media, Viability, Antigens + antibodies, Storage, USSR

The following requirements are minimum for the virulence of vaccine strains of salmonella and shigella: The LD50 of typhoid, paratyphoid B and Sonne dysentery should not exceed 50 million and Flexner's dysentery c and paratyphoid A -- 275 million during infection in a physiological solution. During infection in 0.4% agar the LD50 of paratyphoid A and Flexner's dysentery c strains should not exceed 20 million. The median (50%) immunizing dose during infection of 2.5 - 3 LD50 of a test-culture in typhoid and Sonne dysentery strains with a single immunization should not exceed 30 million, and in paratyphoid B strains - 60 million. In Flexner's dysentery c and paratyphoid A with a double immunization and infection of 2.5 - 3 LD50 of a test-culture it should not exceed 125 million. The index of effectiveness for typhoid, and Sonne dysentery strains with a single immunizing dose of 100 million would be no lower than 3, and for paratyphoid B strains -- no lower than 2.5. For Flexner's dysentery and paratyphoid A strains with a double immunization with a dose equal to 200 million the index should not be lower than 3. Cultures of typhoid and paratyphoid B strains of a 6-hour growth process a higher virulence than 20-hour cultures. The virulence of typhoid strains depends on the relationship of the antigens of the culture. In checking the virulence and immunogenicity of salmonella and shigella strains it is necessary to pay particular attention to standardization of the conditions of cultivation and storage, and also the testing of the strains. (Author)

AD-620 498 Div. 16/2
CFSTI Prices: HC $1.00 MF $0.50
ARMY BIOLOGICAL LABS FREDERICK MD
AN EXPERIMENTAL STUDY OF POLYDISPERSE BACTERIAL AEROSOLS. REPT. II. DETERMINATION OF THE CHIEF PARAMETERS OF THE POLYDISPERSE SYSTEM FOR A CALCULATION OF THE SURVIVAL OF PATHOGENS,
by V. P. Zhalko-Titarenko. 0 Jun 65, 13p. Rept. no. Translation-1451
TT , 65-63604

Unclassified report

Trans. of Zhurnal Mikrobiologii, Epidemiologii, i Immunobiologii (USSR) v42 n1 p123-9 1965.

Descriptors: (*Bacterial aerosols, Viability), Particles, Microorganisms, Electrostatic precipitation, Preparation, Biological stains, Saliva, Corynebacterium, diphtheriae, Culture media, Growth, USSR

Conclusions: A study of the nature of a bacterial aerosol requires a determination of the average content of microbes in the particle. An electrostatic precipitator is proposed for investigating particle preparations microscopically. For obtaining stained preparations, two methods are used -- staining of the cells in the initial suspension prior to spraying in the chamber (for studying freshly formed aerosols), and staining the particles on glass by the lengthy exposure of the pigment (for aerosols with dried particles). The sedimentation phenomena in a polydisperse aerosol proceed with a primary precipitation of large undried particles; that is why the average number of cells in a particle decreases in aerosols in saliva more rapidly than in aqueous aerosols. Drying particles are predominant in aqueous aerosols immediately after their formation, and in aerosols in saliva -- only in an hour after the spraying of the initial suspension. Satisfactory results in determining the survival rate of microbes in a polydisperse aerosol are guaranteed by a soluble granular aerofilter made of sodium alginate, since it makes it possible to effectively capture bacterial aerosols and following dissolving leads to the breaking up of the cellular complexes of the particles. Alginate turned out to be a harmless substance for the diphtheria bacillus. (Author)

AD-620 500 Div. 16/2
CFSTI Prices: HC $1.00 MF $0.50
ARMY BIOLOGICAL LABS FREDERICK MD
IMMUNOBIOLOGICAL EFFECTIVENESS OF THE ASSOCIATED PLAGUE, TULAREMIA AND BRUCELLOSIS VACCINES IN VARIOUS METHODS OF CUTANEOUS APPLICATION,
by V. G. Pilipenko, T. A. Shchekina, and A. M. Polyakova. 0 Jul 65, 13p. Rept. no. translation-1462
TT , 65-63606

Unclassified report

Trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (USSR) v42 n1 p14-21 1965.

Descriptors: (*Vaccines, Injection (Medicine)), Immunity, Pasteurella, Brucella, Diseases, Skin, Effectiveness, Preparation, USSR

Conclusions: The indices of the immunobiological reorganization to plague, tularemia and brucellosis in tests on animals and in observations on humans make it possible to consider inoculation with 3 monovaccines simultaneously, but on various sectors of the skin, equivalent in effectiveness to cutaneous inoculation with a mixture of 3 monovaccines and with dry associated trivaccine. In practice it is possible to carry out a simultaneous inoculation against plague, tularemia and brucellosis with dry live monovaccines in a mixture, and also separately. Here it is necessary to avoid inflicting superficial scarifications on the skin and the appearance of blood when rubbing in the vaccine. Insufficiently deep scarifications on the skin are the main cause of a poor result of inoculation not only with live associated, but also with other live bacterial monovaccines. (Author)

AD-620 501 Div. 16/2
CFSTI Prices: HC $1.00 MF $0.50
ARMY BIOLOGICAL LABS FREDERICK MD
NATURAL FOCUS OF TSUTSUGAMUSHI FEVER,
by I. V. Tarasevich, S. M. Kulagin, N. I.Kudryashova, I. M. Gopachenko, and G. P. Somov. 0 Jun 65, 12p. Rept. no. Translation-1399 TT , 65-63607

Unclassified report

Trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (USSR) v41 n5 p19-24 1964.

Descriptors: (*Rickettsia tsutsugamushi, Disease vectors), Ecology, Antigens ; antibodies, Diagnosis, Morphology (Biology), Rodents, Ticks, Mites, Embryonated egg technique, USSR

As a result of zoologo-parasitological investigations it was established that the fauna of small mammals and trombiculid mites of Southern Primorye is analogous to the fauna of carriers and vectors of R. tsutsugamushi in North Korea and Japan. It is made up mainly by the following species: Apodemus agrarius, Micromys minutus, Rattus norvegious caraco, Cricetulus triton, Microtus fortis, Crocidura lasiura and Leptotrombidium palida, L. orientalis, L. pavlovskyi, Neotrombicula japonica, N. tamiyai, N. mitamura. Three positive results were obtained during the investigation of 128 sera of A. agrarius in the reaction of complement fixation with specific antigen from R. tsutsugamushi (Gilliam strain). Strains of rickettsia were isolated in 6 out of 17 biotests on Ap. agrarius, in 1 out of 7 biotests from M. fortis, in 1 test out of 1 investigation from C. triton, in 1 test out of 2 in C. lasiura. All told 9 strains of rickettsia were isolated from the stated animals. An analogous causative agent was isolated in 6 biotests out of 41 from the larvae of trombiculid mites, represented by species of Leptotrombidium pallida, L. pavlovskyi, L. orientalis, Neotrombicula japonica. Based on morphological, tinctorial, biological and serological properties, the isolated strains were identical to R. tsutsugamushi. On the basis of the data obtained, it is apparent that the region studied is a potential natural focus of infection, identical to tsutsugamushi. (Author)

AD-620 538 Div. 16/2
CALIFORNIA UNIV BERKELEY
AN APPROACH TO STUDY OF MICROFLORA IN ATMOSPHERE,
by R. L. Dimmick, and R. J. Heckly. 01964, 11p.

Unclassified report

Pub. in Proceedings of the Atmospheric biology Conference p187-97 1965. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Microorganisms, Atmosphere), Bacterial aerosols, Controlled atmospheres, Viability, Air, Samplers, Freeze drying, Environmental tests, Culture media, Growth, Biological laboratories, Simulation, Graphics

Living airborne microflora have at least two properties that laboratory microflora do not. First, each airborne cell has survived innumerable changes in environment. Second, each airborne cell maintains its own life in a 'dry' and radiation-filled environment where enzymatic or other biochemical reactions, if not absent, are minimal. Studies of the survival and maintenance of life in conditions like that of the upper atmosphere might be accomplished either by surveying the atmosphere for its living content, or by holding suitable organisms in controlled atmospheric conditions and studying their viability for the purpose of extrapolating to natural conditions. This paper is concerned with the latter approach. General techniques employed in study of microorganisms in contact with the atmosphere are: (1) Aerobiological techniques, wherein cultures are aerosolized into chambers under controlled conditions, air is sampled, and survival is studied. (2) Freeze-drying techniques, wherein cultures are frozen at various temperatures and then placed into a high vacuum until the moisture content has been reduced to between five percent and some unknown lower limit. (3) Surface drying techniques (desiccation), wherein cultures are painted onto surfaces and then exposed to a variety of atmospheric conditions. (Author)

AD-620 540 Div. 16/2
CALIFORNIA UNIV BERKELEY
THYTHMIC RESPONSE OF SERRATIA MARCESCENS TO ELEVATED TEMPERATURE,
by Robert L. Dimmick. 24 Nov 64, 9p.

Unclassified report

Pub. in Journal of Bacteriology, v89 n3 p791-8 Mar 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Serratia marcescens, Heat tolerance), Culture media, Viability, Sensitivity, Aging (Physiology), Rhythm (Biology), Adaptation (Physiology), Mutations

Populations of Serratia marcescens of varied ages and pretreatments, which had been grown in a chemically defined medium, were subjected to thermal stress at 50 to 56 C. The numbers of survivors were plotted vs. time to form survivor curves, and the curves were assembled to form three-dimensional models. The manner in which survivors varied as a function of age and time of heating was variable and often rhythmic. Different three-dimensional patterns were found when different inoculum for the test culture was used. Apparently some 'dead' cells again produced colonies after extended heating periods (recuperation); this tendency varied with the age of the culture. Diminutive colony forms, which produced normal colonies upon transfer, appeared and disappeared during heating; this tendency fluctuated with age. It is suggested that survivor curves represent a distribution of resistant forms within the population, and that this distribution varies in a manner best described in terms of servomechanistic response within each cell and within a given culture. Difficulties of attempting to relate changes in specific molecular species to subsequent whole-cell responses are discussed. (Author)

AD-620 725 Div. 16/2 ,16/4 ,16/3
WALTER REED ARMY INST OF RESEARCH WASHINGTON D C DIV OF COMMUNICABLE DISEASE AND IMMUNOLOGY
MOLECULAR HOMOLOGY OF F-MEROGENOTE DNA.
Revised ed.,
by Stanley Falkow, and R. V. Citarella. 19 Jan 65, 15p.

Unclassified report

Pub. in Journal of Molecular Biology v12 p138-51 1965 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 18 Nov 64.

Descriptors: (*Genetics, Bacteria), (*Bacteria, Genetics), (*Desoxyribonucleic acids, Molecular properties), Escherichia coli, Proteus, Serratia, Sex, Chromosomes, Mutations

F-merogenote DNA isolated from intergeneric hybrids has been examined by the DNA agar technique in an effort to determine its relative size, and the relationship between F-DNA and that of its host, Escherichia coli K12. An Fmerogenote consisting of F and the lac+ gene cluster was found to be equivalent to 2.5% of the E. coli K12 Hfr genome. The size of F alone was estimated to be equivalent to 1.9% of the E. coli genome from the relative degree of homology which exists between different F-merogenotes. A substantial portion (almost one-half) of the sex factor molecule shows a relationship to the E. coli F- genome. The majority of F-merogenote specific DNA duplexes exhibit a mean composition of 50% G + C, but almost 10% of the duplexes show a mean composition of 44% G + C. (Author)

6/15. PHARMACOLOGY

AD-620 213 Div. 16/11,28/3
CFSTI Prices: HC $2.00 MF $0.50
STANFORD RESEARCH INST MENLO PARK CALIF
EFFECT OF DRUGS ON MOTOR PERFORMANCE AND RESPONSE TO AUDITORY STRESS IN MICE AND RATS.
Technical rept.,
by Leon S. Otis. 1 Sep 62, 33p. Contract Nonr299300 Proj. BU-3024

Unclassified report

Descriptors: (*Psychotropic agents, Anticonvulsants), (*Anticonvulsants, Psychotropic agents), Drugs, Motor reactions, Auditory signals, Stress (Psychology), Convulsive disorders, Stimulation, Inhibition, Behavior, Barbiturates, Tranquilizers, Amphetamines, Purine alkaloids, Chlorpromazine, Dosage, Tables, Mice, Rats

Mice susceptible to audiogenic seizures and normal mice were used to evaluate the anticonvulsant activity of monoamino oxidase inhibitors. Tranylcypromine, pheniprazine, etryptamine, phenelzine, and nialamide inhibited the tonic extensor component of audiogenic seizures. Iproniazid inhibited both the tonic and clonic components of audiogenic seizures. With the exception of etryptamine, none of the inhibitors was active in preventing convulsions induced by electroshock (M.E.S. Test). The incidence of audiogenic seizures in two strains of mice was found to be markedly reduced by providing an outlet for escape from a sound chamber in which the animals were exposed to intense auditory stimulation. Escape behavior was found to be inhibited by chlorpromazine, triflupromazine, and perphenazine, but not by imipramine, pentobartibal, or phenobarbital. Chlorpromazine and related analogs (perphenazine, trifluoperazine, prochlorperazine, and triflupromazine) were found to inhibit the escape response of rats from intense auditory stimulation. Phenobarbital, captodiamine, phenytoloxamine, imipramine, and phenaglycodol did not prevent escape. At high doses, carisoprodol, meprobamate, and ectylurea had a slight inhibiting effect on escape. Amphetamine and pheniprazine increased performance time of mice on the rotating rod, whereas the effects of caffeine were questionable. (Author)

AD-620 268 **See Fld. 6/9**

AD-620 275 Div. 16/11
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
COMPARISON OF SCOPOLAMINE HYDROBOMIDE AND DRAMAMINE IN THE TREATMENT AND PREVENTION OF AIRSICKNESS,
by John D. Boland, and Alan D. Grinsted. 15 Apr 50, 15p. Proj. NM001 059 17 01 NAVMED , NM-001-059.17.01

Unclassified report

Descriptors: (*Antimotion sickness agents, Effectiveness), Scopolamine, Antihistaminics, Motion sickness, Aviation personnel, Naval personnel, Drugs, Dosage, Psychology, Aviation medicine, Statistical analysis

Previous studies have shown the value of scopolamine hydrobromide in the prevention and treatment of airsickness, and of dramamine in the prevention of seasickness. This study was conducted to determine the effectiveness of dramamine in the case of airsickness, with scopolamine hydrobromide as a criterion. Students suffering from airsickness during flight training were used as subjects. A criterion group of fifty were given a standard dose of scopolamine and an experimental group of fifty were given identical-appearing capsules containing a standard dose of dramamine. The two groups were taken in roughly random order as they reported to the flight surgeon for help, and no subject knew what medication was being used. If a student eventually discontinued treatment and was able to continue flight training

without further airsickness in the primary and basic phase of his training, he was classed as a successful case. Others were recorded as failures. Follow-up contacts were made to obtain an accurate record of success or failure in each case. Such imbalance of known factors as chanced to occur between the two groups were found, if anything, to foreordain that the criterion group (on scopolamine) would respond the more readily, other things being equal. However, the subjects in the experimental groups (on dramamine) responded with equal success. Such minor side effects as were reported suggest the need for future research on the size of the dose needed for beneficial results. A study of the relative merits of these drugs in preventing airsickness on protracted flights is also recommended. (Author)

AD-620 316 Div. 16/11
CFSTI Prices: HC $1.00 MF $0.50
MEDICAL COLL OF VIRGINIA RICHMOND
EFFECTS OF METHYL ALCOHOL ON CEREBRAL BLOOD FLOW AND METABOLISM: OBSERVATIONS DURING AND AFTER ACUTE INTOXICATION.
Research rept.,
by Louis L. Battey, John L. Patterson,Jr., and Albert Heyman. 24 Oct 56, 11p. Contract N9ONR92500 Proj. NR112 607 ,NM001 103 501
NAVMED , NM-001-103-501-11
Unclassified report

Prepared in cooperation with Naval School of Aviation Medicine, Pensacola, Fla.

Descriptors: (*Alcohols, Poisoning), (*Brain, Alcohols), Blood circulation, Oxygen consumption, Metabolism

Five patients with acute methyl alcohol poisoning were studied during the 1951 outbreak of this form of intoxication in Atlanta, Georgia. The cerebral blood flow and oxygen consumption was studied by the nitrous oxide method of Kety and Schmidt. Mean blood flow through the brain and oxygen uptake of the brain were reduced 30 per cent below normal barriers at the time of acute intoxication, and one week later both of these functions had improved in the four surviving patients but were still 14 per cent below normal. The depression of cerebral metabolism showed poor correlation with the reported amount of methanol ingested. (Author)

AD-620 411 See Fld. 6/16

AD-620 618 Div. 16/11
DELAWARE UNIV NEWARK
TRANYLCYPROMINE AND MUSCULAR PERFORMANCE IN MICE,
by Charles G. Wilber. 01965, 1p. Contract DA49 193MD2627
Unclassified report

Pub. in American Zoologist v5 n2 p203 May 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Drugs, Motor reactions), Psychotropic agents, Muscles, Swimming, Dosage, Hypotension, Mice

'Parnate' is a brand of tranylcypromine. It is a monoamine oxidase inhibitor. Forced swimming by 6 mice at various respective dosages was used to ascertain the effect of this drug on muscular performance in mammals. The drug was injected intraperitoneally dissolved in normal saline solution. The controls received an equal volume of saline solution. The following doses in mg/kg were used: 0 (controls), 50, 75, 100, 125. Control mice swam (water, 26C) for an average of 25 minutes. All mice treated with 'parnate' swam less than 25 minutes; e.g., at 100 mg/kg the mean swimming time was 1 minute. The ED50 (the dose which reduced swimming time by 50 percent of control level) was 65 mg/kg. Analysis of variance of the results gave a value $F = 6.4$; a value of $F = 4.94$ indicates significance at the 0.01 level. The effect of 'parnate' is observed in mice forced to swim immediately after injection or after a 5-minute delay. The level of significance is greater in the latter case. It is possible that doses less than 50 mg/kg may have a stimulating effect on swimming time--a situation observed with other drugs, e.g., ethanol. Experiments are being carried out to test the matter. Hypotension is one of the known effects of higher dosages of 'parnate'--a fact which may well account for depressed muscular performance. (Document is quoted in its entirety.)

AD-620 624 Div. 16/11,16/3
SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TEX PHYSIOLOGICAL CHEMISTRY BRANCH
EFFECT OF HYDRAZINE ON PLASMA FREE FATTY ACID TRANSPORT,
by David L. Trout. 14 Dec 64, 9p.
Unclassified report

Pub. in Biochemical Pharmacology v14 p813-21 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Hydrazine, Fatty acids), (*Fatty acids, Hydrazine), Transport properties, Blood chemistry, Blood, Glucose, Hypoglycemia, Blood plasma, Adipose tissue, Liver, Labeled substances, Tracer studies, Rats

Effects of intravenously injected hydrazine (1.15-1.20 mmoles/kg) on plasma free fatty acid (FFA) transport were studied in one-day fasted, anesthetized rats. Two hours after hydrazine injection, blood glucose levels were depressed, and plasma FFA concentration and pool size were elevated to twice the control level. When, at this time, the plasma free fatty acid pool was labeled with palmitic or oleic acid-1-14C, its fractional turnover rate appeared to be little affected by hydrazine. However, an increase was observed in the fraction of the labeled fatty acids which, on leaving the blood, appeared in the liver. The chief component of plasma FFA transport to the liver was accelerated to more than twice the rate in control rats. (Author)

AD-620 629 Div. 16/11
NATIONAL TAIWAN UNIV TAIPEI (CHINA) COLL OF MEDICINE
ISOLATION OF COAGULANT AND ANTICOAGULANT PRINCIPLES FROM THE VENOM OF TRIMERESURUS GRAMINEUS,
by Shoei-yn Shiau, and Chaoho Ouyang. 01965, 9p. Contract DA MD49 193 64G109
Unclassified report

Pub. in Toxicon v2 p213-20 1965 (Copies available only to DDC users).

Descriptors: (*Venoms, Blood coagulation), (*Anticoagulants, Venoms), Reptiles, Thrombin, Prothrombin, Fibrinogen, Enzymes, Peptide hydrolases, Carboxylic ester hydrolases, Electrophoresis, Taiwan

The venom of Trimeresurus gramineus was separated into five fractions, namely alpha, beta, gamma, delta, and epsilon by means of zone electrophoresis on starch with borate-NaCl buffer; pH 7.6, and ionic strength 0.062. Only the alpha-fraction migrated towards the anode. The beta-fraction remained at the position of application and the other three fractions migrated towards the cathode. The highest thrombin-like and TAMe-esterase activities were located next to the peak of the alpha-fraction on the anode side. Both activities were about seven times stronger than those of the crude venom. The proteolytic activity of the alpha-fraction was less than one half that of the crude venom. The beta-fraction showed only feeble thrombinlike, TAMe-esterase and proteolytic activities. The gamma-fraction was the principal portion with anticoagulant as well as proteolytic activities. The delta and epsilon-fractions had little effect on blood coagulation, although a moderate proteolytic activity was present in the delta-fraction. (Author)

AD-620 704 See Fld. 6/5

AD-620 719 Div. 16/11
ARMED FORCES INST OF PATHOLOGY ARMY MEDICAL CENTER WASHINGTON D C
AEROSPACE TOXICOLOGY PROCEDURES: CURRENT PRACTICES AND TRENDS AT THE ARMED FORCES INSTITUTE OF PATHOLOGY,
by Leo R. Goldbaum, and Thaddeus J. Domanski. 01965, 3p.
Unclassified report

Pub. in Aerospace Medicine, v36 n7 p662-4 Jul 1965. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Space medicine, Toxicity), (*Drugs, Space medicine), Pathology, Urine, Tissue extracts, Separation, Purification, Chromatographic analysis, Ultraviolet spectroscopy, Chemical analysis, Pharmacology

Emergent findings pertaining to an altered approach to the analysis of biologic specimens for the presence of therapeutic concentrations of a number of the basic drugs commonly employed are presented. Direct ether extraction is applied to a relatively small amount of urine or solid tissue. Drug separation and purification are accomplished by simple, akaline distillation. Drug identification and quantitative estimation are made by means of gas-liquid chromatography, ultraviolet spectrophotometry and chemical tests. The present comments are confined to qualitative aspects of these studies. (Author)

AD-620 782 Div. 16/11,16/10
CALIFORNIA UNIV OAKLAND NAVAL BIOLOGICAL LAB
ROLE OF HYPERREACTIVITY OF BRONCHIAL AND PULMONARY VASCULAR MUSCLE TO ACETYLCHOLINE AND HISTAMINE IN ANAPHYLACTIC SHOCK IN RABBITS AND GUINEA-PIGS,
by J. Ng, Y. M. Seys, and G. J. Hildebrand. 01965, 11p.
Unclassified report

Pub. in Int. Arch. Allergy v27 p35-45 1965 (Copies available only to DDC users).

Descriptors: (*Vasoactive agents, Allergy), (*Allergy, Vasoactive agents), (*Acetylcholine, Allergy), (*Histamine, Allergy), Immunology, Lungs, Bronchi, Blood vessels, Muscles, Antigen-antibody reactions, Blood pressure, Pathology, Toxins + antitoxins, Rabbits, Guinea pigs

The role of hyperreactivity of bronchial and vascular muscle to circulating acetylcholine (ACh) and to histamine in anaphylactic shock (AS) was investigated in rabbits and guinea-pigs. No increase in the responsiveness in intratracheal, systemic arterial and right ventricular blood pressures to ACh or histamine was observed in either species during AS. Endotoxin-induced hyperreactivity of pulmonary vasoconstrictor mechanisms to ACh in rabbits that had survived AS, demonstrated the capacity of pulmonary blood vessels to develop such a hyperreactivity. The results of the experiments indicate that hyperreactivity of bronchial or pulmonary vascular muscle to circulating ACh or to histamine does not play a role in the changes observed in arterial, right ventricular and intratracheal pressures during AS in rabbits and guinea-pigs. (Author)

6/16. PHYSIOLOGY

AD-620 119 See Fld. 17/2

AD-620 150 See Fld. 5/10

AD-620 197 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA

PEAK RATES OF OXYGEN FLOW FROM OXYGEN SUPPLY SYSTEMS: FREQUENCY OF SIMULTANEOUS INSPIRATIONS IN A GROUP OF TEN SUBJECTS.
Research rept.,
by J. H. Weatherby, and A. S. Burt. 12 Apr 45, 16p. Rept. no. RR-5 ,NSAM-134
Proj. X324

Unclassified report

Descriptors: (*Oxygen consumption, Respiration), (*Respiration, Oxygen consumption), Exercise, Relaxation (Physiology), Graphics, Tables, Aviation medicine

Rates of pulmonary ventilation, relative durations of inspiration and expiration, and peak inspiratory rates were measured in a number of individuals at rest and during mild exercise. In a group of ten subjects having an average weight of 147.4 pounds the average minute volume was 8.16 liters. In another group of ten subjects having an average weight of 158 pounds the following averages for the group were obtained: at rest; minute volume 9.45 liters; peak inspiratory rate 34 liters per minute; inspiration 34.9% of total cycle; and a ratio between peak inspiratory rate and minute volume of 3.6. During mild exercise the averages for the same group were: minute volume 15.7 liters; peak inspiratory rate 58.4 liters per minute; inspiration 40.07% of total cycle; and a ratio between peak inspiratory rate and minute volume of 3.7. Rate of flow records obtained while a group of ten subjects received oxygen from a multiple place manifold were analyzed to ascertain frequencies of occurrence of various multiples of the average peak inspiratory rate.

AD-620 200 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
PEAK RATES OF OXYGEN FLOW FROM OXYGEN SUPPLY SYSTEMS.
Research rept.,
by J. H. Weatherby, and A. S. Burt. 1 Mar 45, 15p. Rept. no. RR-3 ,NSAM-131
Proj. X324

Unclassified report

Descriptors: (*Oxygen consumption, Respiration), (*Respiration, Oxygen consumption), Exercise, Relaxation (Physiology), Graphics, Tables, Aviation medicine

Measurements of peak rates of flow during random breathing were made on groups of one, two, five and 10 subjects, at rest and during mild exercise. The results were as follows: (A) At rest: one subject 30 liters per minute: two subjects, 58 liters per minute: five subjects, 100 liters per minute; ten subjects, 260 liters, per minute. (B) During mild exercise: one subject, 58 liters per minute; two subjects, 130 liters per minute; five subjects, 270 liters per minute; ten subjects, 490 liters per minute. Maximum peak rates attained during intentional simultaneous inspirations by all members of the groups were as follows: (A) At rest: five subjects, 158 liters per minute; ten subjects, 480 liters per minute. (B) During mild exercise: two subjects, 167 liters per minute; five subjects, 335 liters per minute; ten subjects 675 liters per minute. Peak rates during random breathing by groups of subjects were lower by significant amounts than the theoretical maximum rates required during intentional simultaneous inspirations. (Author)

AD-620 202 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
EVALUATION OF THE EMERGENCY BREATHING PROCEDURE: CONTROL STUDY: DURATION OF CONSCIOUSNESS AT ALTITUDES BETWEEN 19,000 AND 22,000 FEET.
Research rept. (Final),
by C. S. Houston. 5 Jan 46, 10p. Rept. no. RRo4, NSAM-79
Proj. X-343

Unclassified report

Descriptors: (*Anoxia, High altitude), Respiration, Oxygen, Tolerances (Physiology), Aviation personnel, Pilots, Aviation medicine

A total of 636 aircrewmen and pilots were exposed to anoxia at altitudes of 19,000, 20,000, 21,000 and 22,000 feet. Subjects whose condition demanded oxygen prior to the end of the 15 minute period were classed as 'fail'. Those who were conscious at the end of 15 minutes were classed as 'pass'. The data are not statistically significant and are presented merely as approximations and as a guide for future work. The wide variations encountered at these altitudes are re-emphasized, as are the hazards of anoxia of this degree for a prolonged period. (Author)

AD-620 204 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
DYE INJECTION METHOD FOR DETERMINATION OF CARDIAC OUTPUT.
Research rept. (Final),
by B. L. Riley, and John W. Remington. 24 Sep 47, 6p. Rept. no. RR-1 ,NSAM-123
Proj. X-726Av380r

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Heart, Blood circulation), (*Blood circulation, Dyes), (*Dyes, Injection (Medicine)), Blood plasma, High altitude, Adaptation (Physiology), Hemoglobin, Aviation medicine

The dye injection method for determination of cardiac output is based on analysis of the time-concentration curve of dye in the arterial blood during its first circulation after rapid intravenous injection. Technical difficulties included selection and preparation of dye for injection, the proper placement of arterial and venous needles, the collection of adequate samples at one second intervals, the prevention of clotting and hemolysis, and the colorimetric determination of dye concentration. Determinations of cardiac output in normal resting subjects at sea level gave values of approximately 5 liters per minute. Two determinations performed on resting subjects in the low pressure chamber at a simulated altitude of 20,000 feet gave values for cardiac output of 9.8 liters per minute and 16.8 liters per minute. This work constitutes preliminary use and evaluation of the injection method in our hands. Results are to be considered as only approximate. Further evaluation is in progress. (Author)

AD-620 211 **See Fld. 6/3**

AD-620 232 Div. 16/1
CFSTI Prices: HC $3.00 MF $0.75
OFFICE OF NAVAL RESEARCH WASHINGTON D C
ENVIRONMENT MODIFICATION FOR HUMAN PERFORMANCE,
by Richard Trumbull. 29 Jul 65, 68p. Rept. no. ONR-ACR-105

Unclassified report

Descriptors: (*Performance (Human), Adaptation (Physiology)), Tolerances (Physiology), Heat tolerance, Acceleration tolerance, Space crews, Acclimatization, Group dynamics, Stress (Physiology), Fatigue (Physiology), Motivation, Exposure, Sleep, Noise, Central nervous system, Nutrition, Rhythm (Biology), Atmosphere, Vibration, Drugs, Proprioception

Human performance is determined by interaction between a variety of environments. These include the physical, the social and cultural, and the personal environments in which man lives, through which he expresses himself, and on the basis of which he performs. Influence is exerted by the various factors or elements as they exist as well as how they are perceived by him. Characteristically, these environments have been studied by different disciplines, which have reported findings and recommendations through their own journals. This is an attempt to bring relevant data together in a meaningful pattern. It allows fuller appreciation of the contributions of each 'environment' and the requirements for consideration of the total picture. It is a review of the established limits of these many factors as a guide toward presenting optimum conditions for man's performance. The full story has yet to be told through inter-disciplinary and more comprehensive research with performance as the one criterion. Each topic is presented with some results of the more promising techniques for overcoming the influence of the factor involved upon performance. (Author)

AD-620 235 **See Fld. 6/1**

AD-620 252 **See Fld. 6/12**

AD-620 253 Div. 16/1
CFSTI Prices: HC $2.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
THE EFFECTS OF VISUAL DEPRIVATION ON ADAPTATION TO A ROTATING ENVIRONMENT.
Research rept.,
by Robert S. Kennedy, Gilbert C. Tolhurst, and Ashton Graybiel. 18 Mar 65, 40p. Rept. no. NSAM-918
NAVMED , MR005.13-6001.1-106

Unclassified report

Prepared in cooperation with National Aeronautics and Space Administration, Washington, D. C. Office of Life Science Programs.

Descriptors: (*Vision, Motion sickness), (*Motion sickness, Rotation), (*Rotation, Adaptation (Physiology)), Sensory deprivation, Performance (Human), Vestibular apparatus, Semicircular canals, Posture, Exposure, Transfer of training

Three experiments were performed in the Slow Rotation Room to evaluate the influence of visual deprivation on several indices of adaptation to rotation. Data were obtained on tests of postural equilibrium, the Coriolis illusion, and canal sickness symptomatology. Reduction in the magnitude of the Coriolis illusion was observed whether vision was permitted or denied, but there was more variability in the latter condition. Equivalent or better postural performance was observed 'without' vision, and fewer symptoms of canal sickness were observed in this mode. (Author)

AD-620 254 **See Fld. 6/3**

AD-620 255 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
TISSUE DOSAGES FROM ALPHA PARTICLES AND HEAVY NUCLEI IN SOLAR PARTICLE BEAMS IN SPACE.
Research rept.,
by Hermann J. sSchaefer. 17 Jun 65, 15p. Rept. no. NSAM-933
NAVMED , MR005.13-1002.1-32

Unclassified report

Prepared in cooperation with National Aeronautics and Space Administration, Washington, D. C.

Descriptors: (*Tissues (Biology), Solar radiation), (*Solar radiation, Dose rate), Solar flares, Hydrogen, Helium, Carbon, Oxygen, Nitrogen, Fluorine, Space biology, Alpha particles

Recordings of several large flare events indicate that solar particle beams contain, in addition to H and He, also heavy nuclei. For the November

13, 1960 flare in particular, complete rigidity spectra for H and He and C, N, O, F nuclei have been reported. Evaluation of these spectra in terms of tissue depth doses behind 0.1 g/sq cm. shielding shows that, while the He component contributes substantially to exposure in near-surface regions, the dose fraction of the medium heavy component remains, even in the tissue surface, on the level of a few per cent. In view of the smallness of this contribution, it seems unnecessary to extend the spectral resolution of LET sensors up to the Bragg peaks of medium heavy nuclei (1000 kev/micron T). (Author)

AD-620 256 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
RESIDUAL EFFECTS OF STORM CONDITIONS AT SEA UPON THE POSTURAL EQUILIBRIUM FUNCTIONING OF VESTIBULAR NORMAL AND VESTIBULAR DEFECTIVE HUMAN SUBJECTS,
by Alfred R. Fregly, and Ashton Graybiel. 2 Jul 65, 19p. Rept. no. NSAM-935
Proj. MR-005.13-6001 Task 1
NAVMED, MR-005.13-6001.1-115
Unclassified report

Prepared in cooperation with National Aeronautics and Space Administration, Washington, D. C.

Descriptors: (*Vestibular apparatus, Stress (Physiology)), Storms, Seas, Posture, Musculoskeletal system, Diseases, Psychomotor tests, Motion, Audiometry

The residual effects of storm conditions at sea upon postural equilibrium functioning have not been studied objectively. As part of a larger study, the opportunity was taken to investigate by means of a new quantitative ataxia test battery differences between vestibular normals (N=20) and labyrinthine defective (L-D) human subjects (N=9). Following a highly stressful sea experience, during which bizarre stimulation of the vestibular apparatus was amply provided, the L-D group maintained or improved their baseline postural equilibrium test performance scores. The ten initially poorest scoring normals as a sub-group were found free of postural decrement in contrast with significant performance decrements observed in the initially highest scoring sub-group of normals. Probable influences over differential results within the normals and between groups as well as differential test findings are discussed. (Author)

AD-620 257 **See Fld. 5/10**

AD-620 259 Div. 16/15
CFSTI Prices: HC $1.00 MF $0.50
OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS
SOME INFLUENCES OF DELAYED SIDE-TONE UPON INTELLIGIBILITY.
Research rept.,
by Chester J. Atkinson. 15 Jul 52, 11p. Rept. no. 13
Contract N6onr22525 Proj. NR-142-993,NM-001-064.01.13
NAVMED, NM-001-064.01.13
Unclassified report

Prepared in cooperation with Naval School of Aviation Medicine, Pensacola, Fla.

Descriptors: (*Speech, Intelligibility), (*Intelligibility, Speech), Voice communication systems, Hearing, Noise

Groups of listeners heard intelligibility tests in noise and in quiet. The speakers read with delays of .02 to .09 second introduced into their side-tone. The listener heard either the original saying or the original plus the delayed saying of speech material. Speech was received less accurately in every condition except when the speakers read with a .05, .08 or .09 second delay in their sidetone. Conclusions: (1) Listeners hear words more accurately if words are received only as an original message; superimposing an original and a delayed rendition of a word renders the word less intelligible under the delay times studies; (2) The delay of .05 second in the side-tone of the speaker appeared to affect the reception of his speech benificially; the intelligibility scores for this condition were significantly higher than at other delay times; (3) An intelligibility increment similar to but less than that observed for the .05 second delay was present for the .08 and .09 second delay of side-tone; (4) The effects of the delayed side-tone upon the intelligibility of a speaker became evident in a period of less than two minutes. (Author)

AD-620 273 Div. 16/1
CFSTI Prices: HC $2.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
THE EFFECT OF HIGH ACCELERATION FORCES UPON CERTAIN PHYSIOLOGICAL FACTORS OF HUMAN SUBJECTS PLACED IN A MODIFIED SUPINE POSITION: SDC PROJECT 9-U-37A: POSITION 3,
by Floyd R. Stauffer. 13 Oct 49, 28p. Proj. NM001 010
NAVMED, NM-001-010-1
Unclassified report

Descriptors: (*Acceleration tolerance, Posture), Stress (Physiology), Respiration, Pain, Cardiovascular system, Aviation medicine

Six male subjects were exposed to acceleration forces up to 12 G resultant for 5-8 seconds on the human centrifuge. During these exposures they were in a modified supinated position in which the bent knees placed the feet at a level somewhat below that of the rest of the body. During rotation of the centrifuge the seat pivoted so that the resultant G force was supplied to the subject in a direction from chest to back. Consciousness, vision, and voluntary finger movements at the highest G obtainable on this centrifuge were not impaired under these conditions. Human tolerance to G force under these conditions seemed to be restricted by respiration and pain. Ear opacity and ear pulse were relatively poor indicators of the cardiovascular changes taking place under these conditions. The cardiovascular system, according to the heart rate and electrocardiogram, did not show severe enough changes to consider it as one of the important factors of human tolerance to G force under these conditions. The pracitcality of this position for aircraft personnel were discussed. (Author)

AD-620 274 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
A DIRECT METHOD FOR DETERMINATION OF OXYGEN AND CARBON DIOXIDE TENSIONS IN BLOOD,
by Richard L. Riley, Dorothy D. Proemmel, and Ruth E. Frank. 31 Aug 45, 13p. Rept. no. NSAM-7
Unclassified report

Descriptors: (*Blood, Gas analysis), (*Oxygen, Blood), (*Carbon dioxide, Blood), Bubbles, Vapor pressure, Chemical analysis, Medical equipment

A direct method for the determination of carbon dioxide and oxygen tensions in blood is described. The method depends upon the equilibration of a bubble of gas with blood at 37C and the analysis of the bubble for carbon dioxide and oxygen. The Roughton-Scholander syringe is used both as the equilibration chamber and bubble analyzer, thus eliminating the necessity for transfer of the bubble. At sea-level, the accuracy of the technique was tested by comparison of results with those of a tonometer technique. At simulated altitudes of 7700 to 14,200 feet (low pressure chamber), the accuracy of the technique was evaluated by comparing arterial tensions with alveolar tensions. Agreement was good in both cases. The carbon dioxide tension of shed blood containing 0.01 to 0.02 per cent sodium fluoride usually increased after 1/2 hour, probably because the blood was treated with an insufficient quantity of sodium fluoride. The oxygen tension of arterial blood dropped several mm. after 1/2 hour at room temperature, and this tendency persisted when the blood was chilled. The oxygen tension of chilled venous blood remained comparatively constant. (Author)

AD-620 281 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
A STATISTICAL ANALYSIS OF THE MEDICAL COMPLAINTS OF FLYING PERSONNEL AT THE NAVAL AIR STATION, PENSACOLA, FLA.
by Ashton Graybiel, Norton Brown, and Raymond Crispell. 2 Mar 43, 17p. Rept. no. NSAM-343
NAVMED, X-190
Unclassified report

Descriptors: (*Aviation personnel, Aviation medicine), (*Aviation medicine, Stress (Physiology)), Statistical analysis, Psychophysiology, Psychiatry, Diseases, Pathology, Motion sickness, Fatigue (Physiology), Naval personnel

The complaints of flying personnel recorded in the medical logs at the several dispensaries were analyzed for the period Feb. 1 to Aug. 1, 1942. During this time both primary and intermediate flying training were in progress. The average number of students and instructors was 2240, and 15,859 separate complaints were logged; repeated visits for the same complaint were not counted. Although most of the complaints were not of a serious character, yet they were responsible for a loss of much flying time. Airsickness, and some of the injuries, colds, headaches, fatigue states, and psychological disorders were clearly related to flying. The psychiatrical problems were the most important and were discovered, for the most part, indirectly, i.e., because of abnormal behavior and difficulties in flying. Airsickness and over-fatigue were also frequent and important complaints. The extremely low incidence of serious organic disease, including venereal infection, is noteworthy. (Author)

AD-620 282 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
THE TREATMENT OF AERO-OTITIS MEDIA BY REDECOMPRESSION,
by H. A. Smedal, H. R. Bierman, and J. L. Lilienthal,Jr.. 01940, 20p. Rept. no. NSAM-59
NAVMED, X-157
Unclassified report

Descriptors: (*Ear, Diseases), (*Decompression, Ear), Therapy, Vacuum, Aviation medicine

The precipitating event preceding the appearance of aero-otitis media is the development of a relative vacuum within the middle ear. The aim of rational therapy should be the relief of this inequality of pressure. Redecompression in a low pressure chamber has proved to be an effective method of obtaining normal pressure relationships between the middle ear and the environment. In 27 of a group of 33 men with severe aero-otitis media, this form of treatment has effected immediate relief of symptoms and rapid resolution of the process. The failures occurred in patients who, for any reason, were unable to effect or to maintain aeration of the middle ear during and after redecompression. (Author)

AD-620 283 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
ON FLICKER FUSION TESTS AS A MEASURE OF FATIGUE IN AVIATORS,
by A. Graybiel, J. L. Lilienthal,Jr., and O. Horwitz. 0 May 43, 7p. Rept. no. NSAM-504
NAVMED, X-190 (Av-F1-5)
Unclassified report

Descriptors: (*Fatigue (Physiology), Pilots), Central nervous system, Measurement, Tests, Aviation medicine

Flicker fusion frequency was determined repeatedly in 32 pilot instructors before and after a working day. No significant correlation was discovered between the alteration in flicker fusion frequency and the state of fatigue. Conclusions: In this study, the flicker fusion test offered no promise as an objective measure of fatigue in aviation. (Author)

AD-620 284 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
REPORT ON A ONE-STEP TEST OF PHYSICAL FITNESS.
01943, 10p. Rept. no. NSAM-557
NAVMED, X-190 (Av-F1-5)
Unclassified report

Descriptors: (*Physical fitness, Naval personnel), Pulse rate, Exercise, Cardiovascular system, Aviation medicine

A test of physical fitness was carried out on 1243 persons at the Naval Air Station, Pensacola, Florida. The test consisted essentially of the determination of the pulse rate before and 2 minutes after a standardized exercise. The exercise, stepping up on a stool 18 inch high every two seconds, was maintained for 80 seconds in the case of subjects below 36 years of age and 60 seconds for those above. The results were analyzed statistically. Conclusion: On the basis of the test under consideration it is impossible adequately to separate the fit from the unfit and it is recommended that the test be altered until the simplest adequate test of cardio-respiratory fitness is found. (Author)

AD-620 285 Div. 16/1
CFSTI Prices: HC $2.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
OPERATION EVEREST.
01946, 48p.
Unclassified report

Descriptors: (*Aviation medicine, Low-pressure research), (*Acclimatization, High altitude), Flight, Tolerances (Physiology), Physiology, Blood analysis, Respiration, Cardiovascular system, Medical examination, Diet, Naval personnel, Aviation personnel, Stress (Physiology)

Operation Everest was conceived by Lieut. Comdr. Charles S. Houston, a seasoned mountaineer who had climbed to 26,000 feet in the Himalayas and who had taken part in the Navy altitude training program for several years. He hoped to keep a small group of men continuously within a low pressure chamber, decreasing the pressure gradually to simulate an actual mountain ascent giving the subjects time to make the necessary physiological changes. In this booklet, the organization of the project and the histories of the personnel involved are outlined.

AD-620 287 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
THE RELATIONSHIPS IN VIVO BETWEEN CARBON MONOXIDE, OXYGEN AND HEMOGLOBIN IN THE BLOOD OF MAN AT ALTITUDE.
Research rept.,
by J. L. Lilienthal,Jr., and R. L. Riley. 01945, 14p. Rept. no. NSAM-73
NAVMED. X-409 (Av-221-f)
Unclassified report

Descriptors: (*Aviation medicine, High altitude), (*Blood analysis, High altitude), Carbon compounds, Monoxides, Oxygen, Hemoglobin, Respiration, Gases, Stress (Physiology), Aviation personnel, Barometric pressure

Three male subjects were studied at varying pressurealtitudes while in equilibrium with inspired gas mixtures containing from 0.005 to 0.015 per cent carbon monoxide. The distribution of COHb, O2Hb and reduced Hb and their related gas tensions confirm in vivo the fundamental 'laws' first defined by Haldane for the equilibria obtaining in vitro. A simple rearrangement of the Haldane equation makes possible an accurate prediction of the amount of COHb obtaining when man is in equilibrium with a CO-contaminated atmosphere at any given altitude. The value of the relative affinity constant of Hb for CO compared to O2 was found to be 204 = 10 p.c. in these experiments. The total barometric pressure has been found to play no role in the distribution of CO and O2 at equilibrium. The hemoglobin of individuals who smoke appears not to differ from that of nonsmokers in its affinity for CO and O2. The symptoms produced by CO are proportional not only to the blood concentration of COHb but also to the duration of exposure to a given concentration. (Author)

AD-620 298 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
HIGH ACCELERATIONS IN INTERMEDIATE TRAINING: INCIDENCE OF SYMPTOMS AND AN ESTIMATE OF TOLERANCE TO 'G'.
29 Dec 45, 7p.
Unclassified report

Descriptors: (*Acceleration tolerance, Blackout (Physiology)), (*Blackout (Physiology), Aviation personnel), Stress (Physiology), Gravity, Instructors, Students, Training, Dive bombing, Gunnery trainers, Aviation medicine

The incidence of obvious symptoms due to high accelerations in instructors and students was estimated by means of a questionnaire. Roughly one-half had experienced greyout or black-out, and one-eighth blacked out frequently. In a primary squadron there was less black-out experienced by students than at a squadron training in dive bombing and gunnery, where one-quarter blacked out frequently. Fifteen of 16 primary instructors admitted blacking out, almost one half frequently. From what is known of the g's produced by the maneuvers responsible for black-out, the tolerance for g of all of these individuals was less than + 6 g, and most of them certainly less than + 5 g, applied for not more than 4 seconds. There was considerable ignorance shown as to the causes of black-out and methods of its prevention. About half the subjects did not known how their tolerance to g could be altered. (Author)

AD-620 300 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
THE RELATIONSHIP OF MIDDLE EAR PRESSURE TO HEARING IN AVIATION,
by H. A. Smedal. 01973, 11p. Rept. no. NSAM-666
Proj. X158Av E15
NAVMED, X-158 (Av-E1-5)
Unclassified report

Descriptors: (*Aviation medicine, Hearing), (*Hearing, Aviation medicine), Aviation personnel, Auditory acuity, Ear, Barometric pressure, Low-pressure research, Low frequency, Audiofrequency, Radio communication systems, Audiometry

A study of normal ears during relatively slight increases in ambient pressure has revealed that unless the middle ear is properly ventilated significant loss of hearing acuity occurs. The tests, made in the low pressure chamber, indicate that a descent from 5000 to 3000 feet without compensation of middle ear pressure reduces hearing acuity from 25 to 30 decibels in the low frequency range (128 to 2048 c.p.s.); and a descent from 2000 to 1000 feet reduces hearing 15 to 20 decibels. In addition there occurs the illusion of fading of a constant intensity stimulus. Since the loss in hearing acuity occurs in the frequency range utilized for both the radio range beacon signal and the voice signal, auditory orientation may become faulty if middle ear pressures are not equalized properly. The fact that such relatively slight changes in pressure may have large effects should be brought to the attention of all personnel concerned with instrument and radio orientation in aircraft. (Author)

AD-620 301 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
INDIVIDUAL VARIATION IN RESPIRATORY RESPONSE TO CARBON DIOXIDE AT ALTITUDE.
Research rept.,
by J. H. Weatherby, and A. S. Burt. 25 Jul 44, 7p.
Rept. no. NASM-67
Proj. X402Av216f
NAVMED, X-402 (Av-216-f)-1
Unclassified report

Descriptors: (*Aviation medicine, Respiration), (*Respiration, High altitude), Carbon dioxide, Anoxia, Barometric pressure, Aviation personnel

The extent of increase in ventilation due to inhalation of carbon dioxide at 15,000 feet is approximately equal to that obtained at sea level when carbon dioxide tensions are the same under the two conditions. Respiratory exchange at sea level while breathing 5 per cent carbon dioxide (36 mm. Hg. tension) was 2.25 times that while breathing air. At 15,000 feet, 9.25 per cent carbon dioxide (35 mm. Hg. tension) was required to obtain the same change in ventilation. Pronounced variability in response to carbon dioxide was noticed not only among different individuals but also in the same individual at different times both at sea level and at 15,000 feet simulated altitude. At 15,000 feet the subjective indications of anoxia were relieved slightly, though definitely, by carbon dioxide tensions of 27 mm. Hg. or more in the inspired air. Conclusions: The respiratory response of a group of subjects to carbon dioxide was the same at 15,000 feet pressure altitude as at sea level when the same tension of carbon dioxide in the inspired air was used in both cases. Therefore, the respiratory response to carbon dioxide at this altitude is not altered by anoxia. (Author)

AD-620 302 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
THE DETERMINATION OF ARTERIAL CARBON DIOXIDE CONTENT FROM SAMPLES OF 'CAPILLARY' BLOOD.
Research rept.,
by J. L. Lilienthal,Jr., and R. L. Riley. 30 Sep 44, 10p. Proj. X323Av184f
NAVMED, X-323 (Av-184-f)-3
Unclassified report

Descriptors: (*Blood, Gas analysis), (*Carbon dioxide, Blood), Arteries, Capillaries, Analysis

The accuracy of the microgasometric method for the determination of the carbon dioxide content of blood devised by Scholander and Roughton was tested. The findings of Scholander and Roughton were confirmed fully. In addition, the carbon dioxide contents of samples of blood drawn simultaneously from the brachial artery and from the heated ear lobe were shown to be equivalent. (Author)

AD-620 309 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
RELATION OF PULMONARY VENTILATION TO ARTERIAL OXYGEN TENSION.
Research rept.,
by C. S. Houston, and Martha Nez. 20 Jan 46,

13p. Rept. no. nsam-78
Proj. X675 2

Unclassified report

Descriptors: (*Aviation medicine, Respiration), (*Respiration, High altitude), (*Blood analysis, High altitude), Lungs, Respiration, Oxygen, Nitrogen, Gases, Carbon dioxide, Anoxia, Ph, Arteries

Three resting subjects breathed oxygen-nitrogen mixtures equivalent to 16,500 feet at various rates of pulmonary ventilation. The respiratory volume and arterial oxygen saturation were recorded every minute. After eight to fourteen minutes at the desired ventilatory rate, blood was withdrawn from an indwelling arterial needle, and the arterial pH, and carbon dioxide and oxygen tensions determined directly. Conclusions: In resting subjects breathing 10.5% oxygen, the arterial oxygen tension bears a direct and linear relation to the respiratory minute volume, though no arterial tensions were found to exceed the tracheal oxygen tension. A moderate degree of hyperventilation during this degree of anoxia increases arterial oxygenation, and results in marked subjective improvement without recognizable symptoms of acapnia, at least during a fifteen minute period. Under these experimental conditions, the increase in arterial oxygen tension during hyperventilation is shown to be greater than the decrease in arterial carbon dioxide tension. (Author)

AD-620 310 Div. 16/15
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
A COMPARISON OF THE RELIABILITY AND VALIDITY OF VISUAL ACUITY TEST TARGETS.
Research rept.,
by Richard Trumbull, and Oscar Backstrom,Jr..
3 Apr 64, 28p. Rept. no. NSAM-756
Proj. X676Av357p 1

Unclassified report

Available only for reference use at DDC Field Services. Copy is not available for public sale.

Descriptors: (*Visual acuity, Target recognition), Targets, Reliability, Performance (Human), Eye, Performance tests, Statistical analysis, Correlation techniques, Tables

The validity of five targets for testing visual acuity was determined through the correlation of test results of each target with the Grow chart scores. In addition, the testretest reliability of all six tests was studied. The targets under consideration were: The Sight Screener, a New London letter target, two Randolph Field letter targets, and an adaptation of the Ortho-Rater checkerboard type target. One hundred subjects were employed. Acuity scores, obtained in Snellen equivalents, were translated into logunits to facilitate statistical analysis. Additional systems were essayed for scoring each of the Randolph Field tests. Statistical analyses consisted in (1) deriving test-retest reliability coefficients and coefficients of intercorrelation among the test scores by means of product-moment correlation, (2) determining the significance of the differences between test and retest mean scores, (3) determining the significance of the differences between mean scores on the various tests by the t tests, and (4) obtaining the conventional measures of dispersion and statistical reliability. Results of the statistical analyses and clinical observations of the examiners relating to each test are presented. (Author)

AD-620 313 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
REPORT OF ANALYSIS OF SUMMARIZED LOW PRESSURE DATA,
by R. H. Peckham. 5 Mar 43, 10p.

Unclassified report

Descriptors: (*Gas embolism, Sensitivity), (*Decompression sickness, Sensitivity), Barometric pressure, Statistical data, Aviation personnel, Aviation medicine, Statistical analysis, Performance tests, Low-pressure research

The data are sufficiently extensive to justify a conclusive procedure for selection to predict susceptibility to aeroembolism (bends) in subsequent low pressure tank examinations. The following procedure is recommended: (1) All men to be subjected to 35,000 and 40,000 for a total run of one hour. (2) All men failing first test are required to take a second test. (3) All men passing either test are recommended for high altitude flying. It is further recommended that validation study involving actual high altitude flying be initiated. (Author)

AD-620 315 **See Fld. 5/10**

AD-620 317 Div. 16/10
CFSTI Prices: HC $1.00 MF $0.50
MEDICAL COLL OF VIRGINIA RICHMOND
DYNAMICS OF THE CIRCULATION IN ACUTE HYPERTENSION PRODUCED BY STIMULATION OF THE CEREBRAL CORTEX.
Research rept.,
by Herbert C. Langford, John L. Patterson,Jr., Reno R. Porter, and Ebbe C. Hoff. 1 Mar 57, 14p. Contract N9ONR92500 Proj. NR 112 607, NM 18 01 99 Task 2
NAVMED , NM-18-01-99-2-12

Unclassified report

Prepared in cooperation with Naval School of Aviation Medicine, Pensacola, Fla.

Descriptors: (*Hypertension, Blood circulation), (*Cerebral cortex, Stimulation), Brain, Blood vessels, Blood pressure, Heart, Pulse rate, Cardiovascular system, Dogs

Electrical stimulation of the motor cortex of the dog's brain produced an actue systemic hypertension due to marked vaso-construction, without change in cardiac output. Small increases occurred in right atrial, pulmonary atrial, and pulmonary wedge pressures. Heart rate usually remained constant. A significant correlation was found between mean aortic and pulmonary wedge pressures at the peak of the hypertension. This finding can be explained on the basis of the operation of Starling's law in the intact animal preparation used in this study. (Author)

AD-620 319 Div. 16/1 ,30/3 ,23/5
CFSTI Prices: HC $2.00 MF $0.50
TECHNOLOGY INC DAYTON OHIO APPLIED SCIENCES DIV
DISTORTION ANALYSIS OF THE ACCELERATION PRODUCED BY THE WESTERN GEAR CORPORATION MODEL 4010 HIGH AMPLITUDE VIBRATION MACHINE.
Final rept. for Jun-Sep 64,
by Frank P. Primiano,Jr., Richard D. Lowry, and Neville P. Clarke. 0 Apr 65, 37p. Contract AF33 615 1894 Proj. 7231 Task 723101
AMRL , TR-65-27

Unclassified report

Descriptors: (*Vibrators (Mechanical), Flight simulators), (*Flight simulators, Vibrators (Mechanical)), (*Stress (Physiology), Flight simulators), Aviation medicine, Space medicine, Acceleration tolerance, Test equipment, Vibration, Extremely low frequency, Wave analyzers, Human engineering

The acceleration environment produced by the Western Gear Model 4010 High Amplitude Vibration Machine was surveyed at even fundamental frequencies from 2 to 20 cps at two levels of acceleration, 1 G and 2 G. The frequency components of the motion up to 50 cps were determined by a M-H 9050 Automatic Wave Analyzer and are presented in the form of harmonic distributions for each fundamental. The 'total distortion figure' and 'overall distortion figure' are used as measures of the fidelity with which the acceleration wave approximates a pure sine wave of the fundamental frequency. The data dictated that the 1 G acceleration was more distorted than the 2 G and that at both levels the distortion increased with frequency. (Author)

AD-620 326 Div. 16/15,23/5
CFSTI Prices: HC $1.00 MF $0.50
KRESGE EYE INST DETROIT MICH
DYNAMIC VISUAL ACUITY IN AN APPLIED SETTING.
Research rept.,
by James E. Goodson, and James W. Miller. 25 May 59, 17p. Contract Nonr58600 Proj. NR142 023 ,NM17 01 99 Task 2
NAVMED , NM-17-01-99-2-16

Unclassified report

Prepared in cooperation with Naval School of Aviation Medicine, Pensacola, Fla.

Descriptors: (*Visual acuity, Pilots), (*Flight speeds, Visual acuity), Targets, Performance (Human), Performance tests, Degradation, Deceleration, Velocity, Aviation personnel, Selection, Training, Analysis of variance

A Navy AD-5 (attack bomber) was used to fly subjects over targets (Landolt C's) at angular velocities decelerating from 20, 75, and 110 degrees per second. The dynamic acuity of each subject was then tested in the laboratory using constant angular velocities comparable to those above. Exposure times in the air were the same as those in the laboratory. The results of these tests are compared and implications of the relationships are discussed. (Author)

AD-620 336 Div. 16/15,28/3
CFSTI Prices: HC $1.00 MF $0.50
HONEYWELL INC ST PAUL MINN
VISUAL SEARCH: EYE FIXATIONS AS DETERMINED BY INSTRUCTED TARGET CHARACTERISTICS.
Semiannual rept. for 1 Jan-30 Jun 65,
by L. G. Williams. 12 Aug 65, 8p. Rept. no. T-125
Contract Nonr477400

Unclassified report

Descriptors: (*Vision, Target discrimination), (*Target recognition, Visual perception), Color, Geometric forms, Eye

With prior instruction about single target characteristics, searcher's eye fixations tended strongly to fall on objects of instructed color, but tended less to fall on instructed size or shape. In general, when instructed about multiple target characteristics, fixations were related to a single characteristic, color if provided, otherwise size. (Author)

AD-620 361 Div. 16/15
CFSTI Prices: HC $1.00 MF $0.50
TULANE UNIV NEW ORLEANS LA
THE PERCEPTION OF THE VERTICAL: XI. THE VISUAL VERTICAL UNDER CONFLICTING VISUAL AND ACCELERATORY FACTORS.
Research rept.,
by Cliff W. Wing,Jr., and George E. Passey. 15 Nov 50, 12p. Rept. no. 20
Contract N7ONR43401 Proj. NR 143 455, NM001 063 01 10
NAVMED , NM-001-063.01.20

Unclassified report

Prepared in cooperation with Naval School of Aviation Medicine, Pensacola, Fla. Proj. NM001 063 01 20 (formerly NM001 037) Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Visual perception, Acceleration), (*Acceleration, Visual perception), Vision, Targets, Posture, Aviation medicine, Adaptation (Physiology)

Four Ss made adjustments of the visual vertical in both presence and absence of a visual frame of reference under varying resultant acceleratory forces produced in a human centrifuge. In the absence of a visual frame of reference the subjectively accepted vertical to which S adjusted a target was aligned with the resultant acceleratory force.

The adjustment was made whether or not the resultant force was aligned with S's body axis or acted at some angle to it. In the presence of a visual frame of reference which was in alignment with the resultant force S adjusted the visual vertical to a position which placed the target in alignment with the resultant and the main lines of the visual framework. In the presence of a visual frame of reference which is aligned with S's body axis and a resultant force which acts at some angle with S's body axis and the visual frame of reference S adjusts the visual vertical to a position of compromise. Neither visual or postural cues are accepted to the exclusion of the other. With increased intensity of the postural cues furnished by an accelerator force the visual vertical is located relatively nearer to the vertical determined by the resultant force. (Author)

AD-620 362 Div. 16/15
CFSTI Prices: HC $1.00 MF $0.50
TULANE UNIV NEW ORLEANS LA
INTERACTION OF VESTIBULAR STIMULI OF DIFFERENT MAGNITUDES AND OPPOSITE DIRECTIONS. PART I. PERCEPTION OF VISUAL APPARENT MOTION DURING ANGULAR ACCELERATIONS.
Research rept.,
by F. E. Guedry Jr., and J. I. Niven. 8 Dec 54, 17p. Rept. no. 36
Contract N7ONR43401 Proj. NR 143 455, NM001 063 01 36
NAVMED , NM-001-063.01.36
Unclassified report

Prepared in cooperation with Naval School of Aviation Medicine, Pensacola.

Descriptors: (*Visual perception, Acceleration), (*Vestibular apparatus, Stimulation), (*Illusions, Visual perception), (*Acceleration, Visual perception), (*Semicircular canals, Physiology), Stress (Physiology), Motion, Rotation

Normal head movements involve positive angular accelerations followed immediately by negative angular accelerations. The cupula-endolymph system of the semicircular canal in man may be assumed to respond to angular acceleration in the manner of a heavily-damped torsion pendulum. In this study, three subjects were accelerated to a predetermined level and then braked to a stop to produce positive and negative angular accelerations in quick succession. They reported on the direction and duration of apparent motion of a visual target (oculogyral illusion). The obtained data were fitted by theoretical equations which were derived from the standard differential equation for a torsion pendulum. The correspondence between theoretical and experimental data was satisfactory and these experiments tend to confirm the validity of the torsion pendulum analogy for semicircular canal function. (Author)

AD-620 363 Div. 16/1
TULANE UNIV NEW ORLEANS LA
THE EFFECT OF VISUAL STIMULATION ON THE DURATION OF POSTROTATIONAL APPARENT MOTION EFFECTS.
Rept. no. 1,
by Frederick E. Guedry Jr., 01948, 15p. Rept. no. 8
Contract N7ONR43401 Proj. Nr 140 455, NM001 037
NAVMED , NM-001-037-8
Unclassified report

Prepared in cooperation with Naval School of Aviation Medicine, Pensacola, Fla. Available only for reference use at DDC field services. Copy is not available for public sale.

Descriptors: (*Aviation medicine, Vision), (*Rotation, Vision), Eye, Illumination, Motion, Stimulation, Illusions, Acceleration, Deceleration, Analysis of variance

In order to investigate the effect of a visual stimulus upon postrotational nystagmus, equipment was set up which provided for rotation at 20 rpm. Two experimental conditions were planned: (1) In condition A, Ss were rotated for 100 seconds in a counterclockwise direction. They were required to observe the apparent motion of a dimly light tridimensional target which moved with the rotating equipment. There was no illumination save from that of the target. (2) In condition B the rotation was at the same rpm and two seconds after cessation of rotation the overhead light was turned on for a period of five seconds. S was required under both conditions to observe the apparent motion of the target during and after rotation. The data were treated by the method of analysis of variance. From the results the following conclusions were drawn: (1) Upon cessation of rotation the apparent motion of a tri-dimensional target of dim illumination in an otherwise dark room is inhibited during a period of illumination of the room. (2) The duration of postrotational apparent motion is significantly decreased by the temporary period of illumination. (3) From trial to trial there is a significant decrement in the duration of postrotational apparent movement (habituation) even in those trials where there is no overhead illumination.

AD-620 366 Div. 16/15
CFSTI Prices: HC $1.00 MF $0.50
TULANE UNIV NEW ORLEANS LA
JUDGMENT OF THE POSTURAL VERTICAL DURING EXPOSURE TO A MISLEADING VISUAL FRAMEWORK IN UNILATERALLY LABYRINTHECTOMIZED SUBJECTS.
Research rept.,
by Paul E. Thetford, and Fred E. Guedry Jr., 28 Jul 52, 8p. Rept. no. 27
Contract N7ONR434 Proj. NM001 063 01, NR143 455
NAVMED , NM-001-063.01.27
Unclassified report

Prepared in cooperation with Naval School of Aviation Medicine, Pensacola, Fla.

Descriptors: (*Proprioception, Posture), (*Visual perception, Adaptation (Physiology)), Vestibular apparatus, Performance tests, Ear, Decision making

Four unilaterally labyrinthectomized human Ss made judgments of the postural vertical in the presence of a tilted visual framework. In general, the estimates of postural verticality were not displaced in the direction of the injured side. The tilted visual framework did not have unusual effects on the judgments rendered Hence these Ss with one functional labyrinth did not demonstrate a less stable conception of verticality than previously observed 'normals.' (Author)

AD-620 374 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
SYMPTOMATOLOGY UNDER STORM CONDITIONS IN THE NORTH ATLANTIC IN CONTROL SUBJECTS AND IN PERSONS WITH BILATERAL LABYRINTHINE DEFECTS,
by Robert S. Kennedy, Ashton Graybiel, Robert C. McDonough, and Frederick D. Beckwith. 25 May 65, 15p. Rept. no. NSAM-928
NAVMED , MR005.13-6001.1-112
Unclassified report

Descriptors: (*Motion sickness, Vestibular apparatus), (*Vestibular apparatus, Motion sickness), Stress (Physiology), Etiology, Semicircular canals, Ear, Deafness, Anxiety, Fear, Storms, Seas

Ten labyrinthine defective (L-D) and twenty normal subjects were exposed to extremely severe weather conditions during a sea voyage. The effects of such a stress were complicated by a feeling of fear in all of the normal and in some of the L-D subjects. None of the latter manifested typical symptoms of motion sickness whereas all of the normal subjects did. The fact that the L-D subjects did not become sick suggests that, even in instances where motion sickness symptoms appear to be triggered by anxiety, the vestibular organs plan an essential etiological role. (Author)

AD-620 375 **See Fld. 5/9**

AD-620 378 Div. 16/15
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
THE PROTECTION TO NIGHT VISION AFFORDED BY SUNGLASSES.
Research rept.,
by Brant Clark, M. L. Johnson, and R. E. Dreher. 18 Oct 45, 12p. Rept. no. 2
Proj. X-567Av295p
Unclassified report

Descriptors: (*Vision, Adaptation (Physiology)), (*Eyeglasses, Vision), Retina, Sensitivity, Polarizing filters, Sun, Thresholds (Physiology), Measurement, Naval personnel

The protection afforded by low transmis. on sunglasses to retinal sensitivity has been studied in three subjects. When the subjects wearing a 12% polarizing filter over one eye were exposed to sunlight for three to four hours, there was an immediate elevation of the night visual threshold in the unprotected eye over that of the protected eye. The threshold of the unprotected eye remained elevated overnight to a degree which is probably of practical significance. When the filter was changed to the opposite eye, there was an immediate reversal of sensitivity in the two eyes indicating that the effects of these exposures to sunlight were temporary. The results of monocular photopic Contrast Discrimination Tests given after 60 minutes of dark adaptation showed that a slight interference with cone function also occurred immediately after prolonged exposure to sunlight. This interference with cone function did not persist overnight. (Author)

AD-620 403 Div. 16/10
CFSTI Prices: HC $3.00 MF $0.75
CALIFORNIA UNIV DAVIS
THE INFLUENCE OF CHRONIC ACCELERATION ON THE EFFECTS OF WHOLE-BODY IRRADIATION IN RATS.
Doctoral thesis,
by Harold Wilton Casey. 01965, 77p. Contract AF33 608 1045
Unclassified report

Descriptors: (*Radiation effects, Acceleration), (*Acceleration, Radiation effects), Whole body irradiation, Adaptation (Physiology), Stress (Physiology), Lethal dosage, Sublethal dosage, Pathology, Histology, Necrosis, Neoplasms, Metabolism, Rats, Mice, Hamsters, Chickens

The following conclusions are drawn from the results of the studies combining acute whole-body irradiation and acceleration. Rats survive and physiologically adapt to 3.0 G chronic acceleration. A reduced body mass and depletion of body fat deposits are the only detectable changes from normal rats. Acceleration following exposures to acute whole-body irradiation, with doses in the mid-lethal range, increases radiation mortality. The mortality increases progressively with accelerative forces of 2.0 and 3.0 G. Prior adaptation to acceleration does not influence the increased radiation mortality. The detrimental effects of acceleration are operative only during the first week following irradiation. Pathological lesions in rats dying or sacrificed following acceleration and irradiation are typical of those produced by irradiation and are not modified by acceleration. Deceleration to normal gravity followed by irradiation does not influence the effects produced by radiation. (Author)

AD-620 409 Div. 16/10,16/7
ARMED FORCES INST OF PATHOLOGY ARMY MEDICAL CENTER WASHINGTON D C
LESIONS MISTAKEN FOR MALIGNANT MELANOMA OF THE IRIS,

by Andrew P. Ferry. 31 Dec 64. 10p. Contract PHS TG5379 03

Unclassified report

Pub. in Archives of Opthalmology v74 p9-18 Jul 1965 (Copies not available to DDC or Clearinghouse customers). Available from Ophthalmic Pathology Branch, Armed Forces Inst. of Pathology, Washington, D. C. 20305.

Descriptors: (*Eye, Pathology), (*Neoplasms, Eye), Ophthalmology, Diagnosis, Histology, Excision, Cancer

Of 69 eyes enucleated with a clinical diagnosis of malignant melanoma of the iris, on the basis of a visible lesion, no tumor was present in 24 eyes, or 35%. The various lesions that simulated malignant melanoma of the iris are described. (Author)

AD-620 411 Div. 16/10,16/11
ARMED FORCES INST OF PATHOLOGY ARMY MEDICAL CENTER WASHINGTON D C
SKIN CHANGES INDUCED BY UV-IRRADIATED LINOLENIC ACID EXTRACT,
by Vaman S. Waravdekar, Leonard D. Saslaw, Wallace A. Jones, and James G. Kuhns. 01965, 5p.

Unclassified report

Pub. in Archives of Pathology v80 p91-7 Jul 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Skin, Necrosis), (*Linolenic acid, Toxicity), Fatty acids, Ultraviolet radiation, Oxidation, Injection, Hair, Diseases, Peroxides, Histology

Subcutaneous administration of an aqueous extract of ultraviolet-irradiated linolenic acid resulted in alopecic plaque in the skin of mice. The extract induced necrosis in the epidermis; its epithelial appendages and dermis; followed by an inflammatory response, disruption of collagen; and elastic fibers. Hyperplasia of the epidermis and of the follicular sheath was quite marked about seven days after the injection. The follicular hyperplasia was followed by keratogenesis, with the formation of 'keratin cysts' at the original follicular sites. It is presumed that these toxic properties are associated with peroxides and carbonyl compounds present in the extract. (Author)

AD-620 412 Div. 16/10
ARMED FORCES INST OF PATHOLOGY ARMY MEDICAL CENTER WASHINGTON D C
HISTOLOGIC EXAMINATION OF TRACE EVIDENCE,
by Pierre A. Finck. 1 Apr 65. 11p.

Unclassified report

Pub. in Journal of Forensic Sciences v10 n3 p253-62 Jul 1965 (Copies not available to DDC or Clearinghouse customers). Presented at the Annual Meeting of the American Academy of Forensic Sciences (17th), 25 Feb 1965, Chicago, Illinois.

Descriptors: (*Criminology, Histological techniques), (*Histological techniques, Criminology), Pathology, Histology, Brain, Tissues (Biology), Visual inspection, Skin, Burns, Sex, Aging (Physiology)

The paper reports four cases of trace evidence examined grossly and microscopically. The light microscope allowed the identification of brain tissue (Case 1), an exudate consistent with thermal burns (Case 2), Caucasoid skin with a portion of tattoo (Case 3), and Negroid skin (Case 4). In Cases 1, 2, and 4, the specimens were received by the pathologist without preservative 5 weeks, 6 months, and 4 weeks, respectively, after the injury. Formalin fixation (preservation) of the specimen in Case 3 prevented the determination of human species by a serologic test. A precipitin test for human identification was carried out by a forensic serologist in Cases 1, 2, and 4.

AD-620 413 Div. 16/10,16/12
ARMED FORCES INST OF PATHOLOGY ARMY MEDICAL CENTER WASHINGTON D C
THE PSYCHIATRIC CHARACTER OF THE ASSAILANT AS DETERMINED BY AUTOPSY OBSERVATIONS OF THE VICTIM,
by Frank W. Kiel. 14 Apr 65. 10p.

Unclassified report

Pub. in Journal of Forensic Sciences v10 n3 p263-71 Jul 1965 (Copies not available to DDC or Clearinghouse customers). Presented at the Annual Meeting of the American Academy of Forensic Sciences (17th), 25 Feb 1965, Chicago, Ill.

Descriptors: (*Criminology, Pathology), (*Psychiatry, Criminology), Medical personnel, Medical examination, Abnormal psychology, Psychoses, Law

Four cases of violent killing are presented, together with the comments, based only on a picture and a brief history, of 20 medicolegal experts. These comments on the state of mind and character of the assailant are compared with follow-up data on the real assailant. Many clues can be suggested by the forensic pathologist which may help police investigators apprehend the assailant, such as the criminal's probable size, personality, associates, socio-economic condition and family status. Considerable reluctance is expressed by most respondents to stating at trial psychiatric opinions about the assailant, based only on physical evidence of the victim and scene of the crime. Many considered such testimony inadmissible, although the problem probably is more how to weigh such testimony. By straightforward illustrations of the scene and victim, it often is possible to give an impression of the nature of the crime without the necessity for direct questioning. (Author)

AD-620 414 Div. 16/10,16/7
ARMED FORCES INST OF PATHOLOGY ARMY MEDICAL CENTER WASHINGTON D C
GRANULOMA PYOGENICUM OF LIMBUS, SIMULATING RECURRENT SQUAMOUS CELL CARCINOMA,
by Andrew P. Ferry, and Lorenz E. Zimmerman. 23 Feb 65. 2p. Contract PHS 3T1 .PHS NB5379 03S1

Unclassified report

Pub. in Arch Ophthal v74 p229-30 Aug 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Eye, Pathology), Ophthalmology, Neoplasms, Cancer, Medical examination, Histological techniques, Excision, Diagnosis

The case presented is one of granuloma pyogenicum arising at the limbus after excision of an in situ carcinoma. Enucleation of the otherwise normal eye was performed in the mistaken belief that the inflammatory lesion was a recurrent cancer. (Author)

AD-620 415 **See Fld. 6/5**

AD-620 422 **See Fld. 6/5**

AD-620 435 Div. 16/10,26/3
CFSTI Prices: HC $3.00 MF $0.75
OHIO STATE UNIV COLUMBUS DEPT OF PREVENTIVE MEDICINE
EVALUATION OF A METHOD FOR THE DETERMINATION OF INJURY RISK OF ULTRASONIC RADIATION IN A LIQUID MEDIUM.
Master's thesis.
by Theodore Randall Hatfield. 01965. 74p. Contract AF33 608 1095

Unclassified report

Limited number of copies containing color other than black and white are available until stock is exhausted. Reproduction will be made in black and white only.

Descriptors: (*Ultrasonic radiation, Hazards), (*Industrial medicine, Ultrasonic radiation), Wounds + injuries, Liquids, Cleaning, Industrial equipment

A method for the evaluation of injury risk to workers in industries using ultrasonic radiations in a liquid media is described and discussed. The method involves the exposure of the lower extremities of intact animals to ultrasonic radiations at a frequency of 20.5 kHz and a power density of 247 watts per liter. The assessment of injury in the intact living animal utilized the measurement of the serum enzyme levels of lactic and malic dehydrogenase, alkaline phosphotase and aldolase. No statistical differences were noted in the serum enzyme levels before and after exposure to ultrasonic radiations. The assessment of injury in the post mortem animals utilized morphological and histochemical staining of skin and muscle and morphological staining of bone marrow which had been exposed to ultrasonic radiation. No pathological alteration of the tissues either grossly or microscopically was observed. In conclusion it can be said that ultrasonic radiations of the frequency and power density present in ultrasonic cleaners are not capable of producing injury in the intact animal. Thus the risk to industrial workers is very probable negligible. (Author)

AD-620 438 **See Fld. 6/13**

AD-620 444 Div. 16/10,16/12
ARMED FORCES INST OF PATHOLOGY ARMY MEDICAL CENTER WASHINGTON D C
DEMYELINATION AND REMYELINATION IN EXPERIMENTAL ALLERGIC ENCEPHALOMYELITIS,
by Peter W. Lampert. 01965. 15p.

Unclassified report

Pub. in Journal of Neuropathology and Experimental Neurology v24 n3 p371-85 Jul 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Brain, Diseases), (*Nerve cells, Pathology), Reticuloendothelial system, Blood proteins, Central nervous system, Regeneration, Morphology (Biology), Electron microscopy, Membranes (Biology), Neurology

In experimental allergic encephalomyelitis mononuclear cells and plasma proteins pass through the wall of venules. The mononuclear cells exhibit a striking affinity for myelinated axons and oligodendroglial cells. At the node of Ranvier the mononuclear cells penetrate between myelin lamellae or underneath the myelin sheath and, via the outer mesaxon, they peel off the outer myelin lamella. Phagocytosis of oligodendroglial cells possibly precedes the invasion of the myelin sheath at these sites. In the presence of plasma precipitates and mononuclear cells the myelin sheath may also show a focal dissolution or vesicular disintegration of myelin lamellae which is followed by an infiltration of mononuclear cells underneath and between remnants of the sheath. In florid lesions some myelin sheaths present a uniform separation of some or all of their lamellae. This change may be observed in sheaths which undergo vesicular disintegration. There are no visible alterations of myelin sheaths beyond the zone of cellular infiltration. Remyelination occurs in animals recovering from experimental allergic encephalomyelitis. Projections of proliferated oligodendroglial cells wrap around axons and form myelin lamellae by the apposition and fusion of their plasma membranes. One glial cell is related to the myelin sheaths of many axons. The findings are compared with reported studies on myelinogenesis in the central nervous system. (Author)

AD-620 446 **See Fld. 6/13**

AD-620 452 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
THE EFFECTS OF DECOMPRESSION ON SUBJECTS REPEATEDLY EXPOSED TO 43,000 FEET WHILE USING STANDARD PRESSURE BREATHING EQUIPMENT: INCIDENCE OF AEROEMBOLISM IN AN INDIVIDUAL SUBJECTED TO 82 EXPOSURES, A CASE REPORT.
Research rept.,
by Arthur L. Hall, M. M. Shrinegesh, and Maurice N.Johnson. 15 Jul 52, 7p. Proj. NM001 059 21 03

Unclassified report

Descriptors: (*Gas embolism, Decompression sickness), (*Decompression sickness, Gas embolism), Highaltitude, Pressure breathing, Breathing apparatus, Aviation medicine

One human subject was exposed to 43,000 feet for 1/2 hour a day for 82 days. From the seventy-fifth exposure he exhibited an increasing number and severity of aeroembolism symptoms. It is felt that aging played little or no part in the increasing susceptibility of the subject to aeroembolism. (Author)

AD-620 453 Div. 16/10,16/1
CFSTI Prices: HC $1.00 MF $0.50
EMORY UNIV ATLANTA GA
THE PULMONARY VASCULAR RESPONSES TO SHORT-TERM HYPOXIA IN HUMAN SUBJECTS.
Joint research rept.,
by Joseph T. Doyle, Joseph S. Wilson, and James V.Warren. 25 Oct 51, 13p. Contract N9onr92500 Proj. NR112 607,NM001 050 01 04

Unclassified report

Descriptors: (*Hypoxia, Cardiovascular system), (*Cardiovascular system, Hypoxia), Blood circulation, Blood pressure, Blood vessels, Lungs, Capillaries, Blood volume, Oxygen consumption, Hypertension, Cardiovascular diseases, Tables

The acute circulatory reactions to short periods of hypoxia were studied in 8 normal individuals and in 12 individuals with cardiopulmonary dysfunction. In the normal group, a rapid reduction in the arterial oxygen saturation to about 75 per cent caused a considerable increase in the pulmonary vascular resistance and in the cardiac output. The pulmonary capillary pressure was not altered. In the abnormal group, a similar reduction in the arterial oxygen saturation caused a much smaller increase in the pulmonary vascular resistance and little or no increase in the cardiac output. The pulmonary capillary pressure was not altered. A few exceptions to this were noted. In contrast with the normal group, the inhalation of the low oxygen mixture caused severe dyspnea. The most probable cause of the increase in the pulmonary arterial pressure during hypoxia is a direct effect of the low oxygen tension of the returning venous blood on the walls of the pulmonary arterioles. The increase in the cardiac output is a compensatory reaction, initiated by a fall in the peripheral vascular resistance, whereby oxygen transport to the tissues is maintained. In pulmonary disease these reactions may serve a useful purpose. In the presence of severe cardiopulmonary disease these reactions are impaired. Definite evidence of alterations of the pulmonary blood volume during hypoxia could be demonstrated in neither the normal nor the abnormal group. (Author)

AD-620 454 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
THE EFFECTS OF DECOMPRESSION ON SUBJECTS REPEATEDLY EXPOSED TO 43,000 FEET WHILE USING STANDARD PRESSURE BREATHING EQUIPMENT: INVOLUNTARY HYPERVENTILATION DURING PRESSURE BREATHING AT 43,000 FEET.
Research rept.,
by Arthur L. Hall. 20 Feb 52, 10p. Proj. NM001 059 21 01

Unclassified report

Descriptors: (*Pressure breathing, Oxygen), (*Oxygen, Poisoning), Breathing apparatus, High altitude, Decompression, Aviation medicine

Thirty-six healthy young male Navy seamen were exposed to a simulated altitude of 43,000 feet for one-half hour a day for 20 consecutive work days. Continual anoxia photometer readings were taken on each subject to determine arterial blood oxygen saturations. X-rays, electrocardiograms and speech intelligibility tests were taken for each subject. This paper is a report of the incidence of involuntary hyperventilation in these subjects. Other physiological phenomena observed will be reported in other papers. A total of 43 cases of involuntary hyperventilation were observed during 695 man-exposures (240.7 man-hours) at 43,000 feet. The similarity of early subjective symptoms of hypoxia and hyperventilation is noted. (Author)

AD-620 456 Div. 16/1
UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES
AN ELECTROMYOGRAPHIC STUDY OF THE LOW BACK EXTENSORS.
Master's thesis,
by Ella Joyce Fraser. 0 Aug 65, 83p. Contract AF33 608 1048

Unclassified report

Available only for reference use at DDC Field Services. Copy is not available for public sale.

Descriptors: (*Muscles, Biophysics), (*Posture, Biophysics), Musculoskeletal system, Contraction, Motion, Legs, Body weight

The purpose of this study was to determine the amount of activity in the low back extensors in certain postures and activities. The subjects were ten healthy men and women between the ages of twenty-two and thirty-four years. Four sets of surface electrodes were used with placement on both right and left about one inch lateral to the spinous processes and at levels of the second and third and the fourth and fifth lumbar vertebrae.

AD-620 503 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
EFFECT OF VESTIBULAR IRRITATION ON ELECTRICAL ACTIVITY OF THE CORTEX AND BASAL AREAS OF THE BRAIN,
by E. A. Zhirmunskaya, and F. M. Ioselevich. 18 Aug 65, 24p. Rept. no. FTD-TT-65-410 TT , 65-63608

Unclassified report

Unedited rough draft trans. of Vestnik Oto-Rino-Laringologii (USSR) v13 n2 p17-24 1951.

Descriptors: (*Vestibular apparatus, Stimulation), (*Brain, Electric currents), Electroencephalography, Cerebral cortex, Ear, Central nervous system, Measurement, USSR

Relative investigation of electrical activity of cortex and basal sections of the brain revealed certain additional characteristics in the nature of basal electrogram in comparison with the previously described ones. Vestibular irritation causes considerably greater changes in bioelectric activity of the brain, than do other afferent irritations. Electric response to irritation of the vestibular apparatus can be picked-up from all areas of cortex cerebri and in a majority of cases appears to be two-sided symmetrical. Responsive reaction to vestibular irritation in basal areas is expressed much brighter, more intensive and longer lasting, than in the cortex cerebri. Duration and multiphaseness of changes in electrical activity of the brain during vestibular irritation, apparently, are connected with the involvement into responsive reaction of a series of mechanisms, including the vegetative-vascular. A very important role is played in this case by the emotional factor. The obtained data, indicating considerable functional displacements in electrical activity of basal sections of the brain under the effect of vestibular irritation in norm, give bases to assume that illnesses of the central nervous system the changed nature of its reactivity may be easier to detect with the aid of the mentioned afferent irritation. (Author)

AD-620 512 Div. 16/10
TECHNOLOGY INC DAYTON OHIO
THE INVESTIGATION OF THE PARAMETERS OF HEAD INJURY RELATED TO ACCELERATION AND DECELERATION.
Progress rept. no. 1, 1 Jun 64-15 Feb 65,
by Frank P. Primiano Jr.. 15 Feb 65, 30p. Rept. no. 2610-65-2
Contract DA49 193MD2610

Unclassified report

Available only for reference use at DDC Field Services. Copy is not available for public sale.

Descriptors: (*Head, Acceleration tolerance), (*Acceleration tolerance, Head), Monkeys, Acceleration, Deceleration, Wounds + injuries, Electrocardiography, Electroencephalography, Respiration, Blood pressure, Monitors, Stress (Physiology), Posture, Reflexes, Cornea, Cerebrospinal fluid, Instrumentation, Costs

An investigation was made of the effects of acceleration of the approximate center of mass of the head with respect to the body eliminating the effects of deformations of the head as produced by a direct blow. The development of a mechanical device with which the head was accelerated was a major portion of the effort. The forces used to accelerate the head were applied in such a manner as to not cause any visible gross damage to the brain, skull or support tissue. Since it is necessary to know both the direction and magnitude to adequately describe the acceleration vector, the head was guided by the mechanical acceleration device so that it traversed a known path. A circular path was chosen because it lent itself readily to a simple mechanical design and also conformed to natural anatomical articulation. Squirrel monkeys (Saimiri Sciureus) were chosen for the experiments. The effects of the acceleration of the head of the monkey were expressed as changes of a number of physiological functions from baselines determined for each animal prior to the experiment. The symptoms of concussion were manifested to EKG, EEG, respiration rate, blood pressure as a function of time, failure to respond to stimuli, loss of postural tonus, loss of corneal reflex and loss of palpebral reflex. Cerebrospinal fluid pressure was monitored to determine the immediate environment to which the brain is exposed during the acceleration pulse.

AD-620 515 Div. 16/1
CALIFORNIA UNIV SAN FRANCISCO MEDICAL CENTER
STRUCTURE-FUNCTION RELATIONSHIPS IN THE AIRWAYS: BRONCHOCONSTRICTION MEDIATED VIA VAGUS NERVES OR BRONCHIAL ARTERIES; PERIPHERAL LUNG CONSTRICTION MEDIATED VIA PULMONARY ARTERIES,
by J. A. Nadel. 01965, 12p. Contract Nonr22255 Grant ,PHS HE06285

Unclassified report

Pub. in Medical Thoracity v22 n2 p231-42 1965 (Copies available only to DDC users).

Descriptors: (*Respiratory system, Physiology), Lungs, Bronchi, Nerves, Blood vessels, Arteries, Muscles, Contraction, Chemoreceptors, Nerve fibers, Respiration, Histamine, Serotonin, Barium compounds, Sulfates, Mechanical properties

Reflex bronchoconstriction, mediated via vagal efferent nerve fibers is characterized by increased R sub L, decreased V sub D, with no significant

change in static C sub L. Anatomic studies performed during electrical stimulation of the peripheral ends of the cut cervical vagus nerves showed constriction of large airways with no changes in the peripheral airways. Injection of serotonin in the bronchial arteries resulted in changes in the mechanical properties of the lungs similar to vagal stimulation, presumably by a local action of the drug on the airways perfused by the bronchial arteries. Injection of barium sulfate microemboli into the pulmonary arteries increased R sub L and V sub D but decreased C sub L, presumably by releasing histamine. Right-sided injection of histamine or 48/80 resulted in similar effects. Anatomic studies showed that the principal site of constriction was the alveolar ducts. (Author)

AD-620 516 Div. 16/1 ,16/10
CALIFORNIA UNIV SAN FRANCISCO MEDICAL CENTER
TIME-DEPENDENT FACTORS IN PULMONARY GAS EXCHANGE,
by N. C. Staub. 01965, 14p. Contract Nonr22255 Grant ,PHS HE06285
Unclassified report

Pub. in Medical Thoracity v22 n1 p132-45 1965 (Copies available only to DDC users).

Descriptors: (*Respiratory system, Physiology), Lungs, Bronchi, Respiration, Erythrocytes, Capillaries, Gas flow, Oxygen, Carbon dioxide, Diffusion, Hypoxia, Respiratory diseases, Tissues (Biology)

Theoretically, time-limited (diffusion) processes may lead to increases in the alveolar-arterial oxygen tension difference in chronic obstructive airway disease. By examining the relative diffusivity of oxygen in the gas phase and in pulmonary tissue a unit of pulmonary structure and function--the terminal respiratory unit-was defined. Within this unit gas phase oxygen diffusion gradients would never be significant. However, in the secondary lobule which contains several terminal units selective damage as in centrilobular emphysema could lead to micro-unevenness of ventilation and could contribute to functional impairment of gas exchange. Combined alveolar hypoxia and increased rate of red cell flow through the pulmonary capillary bed may be present in panlobular emphysema and contribute to functional disability if there is not enough time for the red cells in the capillaries to reach equilibrium with alveolar gas at the prevailing gradients. (Author)

AD-620 527 Div. 16/1
MICHIGAN UNIV ANN ARBOR DEPT OF PHYSIOLOGY
THE SPECIFIC IMPEDANCE OF THE DORSAL COLUMNS OF CAT: AN ANISOTROPIC MEDIUM,
by James B. Ranck Jr., and Spencer L. BeMent. 5 Oct 64, 15p. Contract NIH NB04352 ,AF AFOSR367 64 Proj. 9769 Task 976903 AFOSR , 65-1166
Unclassified report

Pub. in Experimental Neurology v11 n4 p451-63 Apr 65.

Descriptors: (*Nerves, Electrical impedance), Electric current, Voltage, Resistance (Electrical), Anistropy, Anatomy, Equations, Nerve cells, Cats

Low frequency, nonstimulating current was passed from a small electrode on the surface of the dorsal columns in the cervical cord of cats. A glass microelectrode was used to record the voltage at distances of 0.5 to 2 mm from the current electrode. The voltage fell off more rapidly in depth and across the dorsal columns than it did longitudinally--the resistance was lower in the longitudinal direction. Accordingly, the dorsal columns are anisotropic. An approximate equation is presented which describes the data fairly well and which is consistent with the anatomy. From this equation, the resistivity in the longitudinal direction was 138 to 212 ohm-em and in the transverse direction, 1,211 ohm-cm. These values are shown to be consistent with the view that the anisotropy is primarily due to current flowing longitudinally in axons. The frequency dependence of the specific impedance was also measured. Some features of this frequency dependence have no clear explanation, but some of them are consistent with a nodal membrane having a time constant of roughly 50 microseconds. (Author)

AD-620 536 Div. 16/15,28/3
LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF RESEARCH LABS
MEASUREMENT OF AUDITORY THRESHOLDS,
by A. E. Brown. 2 Apr 65, 7p.
Unclassified report

Pub. in Journal of the Acoustical Society of America, v38 n1 p86-92 Jul 1965. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Hearing, Thresholds (Physiology)), (*Thresholds (Physiology), Hearing), Auditory perception, Psychophysiology, Determination, Auditory signals, Probability, Noise, Statistical analysis, Psychometrics

Two different techniques for determination of thresholds were developed. In the first, called a fixed-point determination, tones of a fixed amplitude and constant duration are presented to a subject on a random basis. The tone is masked by white noise and the subject must identify the presence of the tone. A statistical analysis of his response will determine the probability of correctly identifying the presence of the tone. By presenting various levels of tone amplitude, it is possible to determine the threshold function. The second technique involves adjusting the amplitude of the randomly presented tone such that it is maintained at a level slightly below the 50% probability level. The two techniques have excellent agreement and form a convenient pair for psychophysical investigation. The first technique is slow, but produces the entire threshold function, while the second, faster system gives information on one probability value only. (Author)

AD-620 549 **See Fld. 20/4**

AD-620 600 **See Fld. 6/3**

AD-620 625 Div. 16/10
SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TEX PHYSIOLOGY BRANCH
DISSOLVED NITROGEN AND BENDS IN OXYGENNITROGEN MIXTURES DURING EXERCISE AT DECREASED PRESSURES,
by Eugene A. Degner, Kenneth G. Ikels, and Thomas H. Allen. 01965, 8p.
Unclassified report

Pub. in Aerospace Medicine v36 n5 p418-25 May 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Space medicine, Decompression sickness), (*Decompression sickness, Space medicine), Space stations, Manned, Simulation, Oxygen, Nitrogen, Pressure breathing, Flight simulators, Pressure suits, Exercise, Chromatographic analysis, Blood analysis, Stress (Physiology)

Four types of simulated orbiting laboratory flights of 10 to 21 hours' duration, involving 107 manflights and 93 analyses of N2 dissolved in blood, were performed for the purpose of ascertaining the average intensity and duration of bends pains. Generally bends occurred most often during transfer and reconnaissance. Once bends appeared it reoccurred in subsequent flight stages. This can be avoided by sufficient breathing of O2 such that blood N2 falls to levels insufficient, theoretically, to provide enough N2 molecules to form seed bubbles. On this basis it can be predicted that missions in a pure O2 environment require 120 minutes of O2 breathing at 14.5 psia before decompression to 5 psia and an additional 375 minutes before a second decompression to 3.5 psia. At that time one could return to 5 psia O2 or preferably to 46:50::O2:N2 at 7 psia; the latter takes 33 minutes of O2 breathing before reconnoitering at 3.5 psia. If pressure suits and locks operated successfully at 5 instead of 3.5 psia, O2 breathing time could be saved and danger of bends avoided. (Author)

AD-620 693 Div. 16/1
CFSTI Prices: HC $2.00 MF $0.50
NAVAL MEDICAL FIELD RESEARCH LAB CAMP LEJEUNE N C
OPTIMAL TIME OF EXPOSURE REQUIRED TO PRODUCE ACCLIMATIZATION TO A HOT-WET ENVIRONMENT.
Interim rept.,
by John W. Garden, I. Dodd Wilson, and P. J. Rasch. 0 Aug 65, 29p. Rept. no. vol. 15/No. 22 Proj. MF022 03 04 ,MF022 03 04 8002 NAVMED , MF022.03.04-8002.3
Unclassified report

Descriptors: (*Heat tolerance, Acclimatization), (*Acclimatization, Heat tolerance), Exposure, Exercise, Relaxation (Physiology), Performance (Human), Pulse rate, Perspiration, Electrolytes (Physiology), Body temperature, Performance tests, Adaptation (Physiology), Stress (Physiology), Tables

Thirty-eight young adult males were exercised daily for 2 weeks on a motor-driven treadmill at 3.5 mph located in a heat chamber maintained at 98F. dry bulb and 90F. wet bulb. Twelve subjects walked for 50 minutes followed by 10 minutes rest in the heat; 13 subjects walked 50 minutes, rested 10 minutes, walked 30 more minutes and rested a final 10 minutes; 13 subjects walked 50 minutes, rested 10 minutes, walked 50 more minutes and rested a final 10 minutes. A modified Balke performance test was administered before heat exposure and at the end of each week. Physiological parameters including rectal temperatures, heart rates, sweat loss and sweat electrolytes were used as measures of acclimatization. It was found that the daily exposure to heat for 1 hour did not produce acclimatization as seen in the latter groups. Several differences between physiologic adjustment to a hot-wet as contrasted with hot-dry climates were observed and are discussed. (Author)

AD-620 704 **See Fld. 6/5**

AD-620 720 Div. 16/10
ARMED FORCES INST OF PATHOLOGY ARMY MEDICAL CENTER WASHINGTON D C
HELICOPTER ROTOR BLADE INJURIES,
by Frank W. Kiel. 01964, 3p.
Unclassified report

Pub. in Aerospace Medicine, v36 n7 p668-70 Jul 1965. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Aviation injuries, Helicopter rotors), (*Helicopter rotors, Aviation injuries), Helicopters, Aviation accidents, Aviation medicine, Wounds + injuries

AD-620 723 Div. 16/1 ,16/12
WASHINGTON SCHOOL OF PSYCHIATRY D C
AVERAGED EVOKED ELECTROENCEPHALOGRAPHIC RESPONSES TO CLICKS IN THE HUMAN NEWBORN,
by A. B. Barnet, and R. S. Goodwin. 24 Sep 64, 10p. Contract DA MD49 193 63G90
Unclassified report

Pub. in Electroencephalography and Clinical Neurophysiology v18 p441-50 1965 (Copies available only to DDC users). Prepared in cooperation with Walter Reed Army Inst. of Research, Washington, D. C.

Descriptors: (*Electroencephalography, Infants), (*Infants, Electroencephalography), Stimulation, Intensity, Behavior, Pulse rate, Hearing, Noise, Sleep, Electrocardiography, Thresholds (Physiology), Psychophysiology, Neurology, Data processing systems, Analysis of variance

Eighteen normal sleeping newborn infants were presented with ten sets of 250 clicks repeated at 1/sec. For a group of twelve, intensity was attenuated in 5 db steps from about 65 db to about 35 db above adult waking threshold and then increased in steps to the original level. To three infants, clicks were presented in the opposite order, i.e., from soft to loud followed by loud to soft. Three other infants were presented sets of clicks at a constant 65 db intensity. EEG responses to the stimuli were electronically averaged. Central-temporal and central-frontal bipolar recordings were made. Behavioral and cardiac responses were also recorded.

AD-620 726 See Fld. 5/10

AD-620 748 Div. 16/1 ,28/1 ,30/2 ,8/2
CFSTI Prices: HC $3.00 MF $0.50
RAND CORP SANTA MONICA CALIF
A NEURAL NET FOR MOTIVATED ELEMENTARY PROBLEM SOLVING,
by E. W. Paxson. 0 Aug 65, 55p. Rept. no. RM-4476-PR
Contract AF49 638 700

Unclassified report

Descriptors: (*Nervous system, Models (Simulations)), (*Behavior, Animals), (*Reasoning, Motivation), Electrical networks, Nerve cells, Artificial intelligence, Digital computers, Decision making, Bionics

The neutral net constructed here reproduced the behavior of a simple 'animal' who explores for food when hungry and returns to a 'den' under the drive of homing. The animal learns to avoid danger, maintains knowledge of position relative to a goal point, and tries to find shortest paths from one goal point to another. The behavior of the net is demonstrated by digital computation. A brief critique of neural net simulation of problem solving is given. (Author)

AD-620 752 Div. 16/1
ILLINOIS UNIV URBANA BIOPHYSICAL RESEARCH LAB
MUSCLE TWITCH TENSION, INFLUENCE OF ELECTRICAL STIMULATING CONDITIONS AT DIFFERENT TEMPERATURES. II. RESULTS FOR NITRATE RINGER'S,
by Elizabeth Kelly, and William J. Fry. 13 Aug 63, 9p.

Unclassified report

Pub. in Physics in Medicine and Biology v9 n4 p559-67 Oct 1964 (Copies available only to DDC users). See also AD-617 809.

Descriptors: (*Muscles, Contraction), Nitrates, Amphibians, Stimulation, Chlorides, Musculoskeletal system, Temperature

An investigation was pursued to correlate the findings of previous investigators on the effect of solutions, such as nitrate Ringer's, on the amplitude of twitch tension at high temperature, with values of the parameters which they employed for electrical stimulation. It was observed that a muscle stimulated in chloride Ringer's by a single stimulus, which elicited the maximum response capability of the muscle for the specific environmental conditions, did not show any large increase in amplitude of tension in nitrate Ringer's. An increase in the amplitude of twitch tension in nitrate Ringer's was observed only when the peak twitch tension of the muscle in chloride Ringer's was inadequate, due either to the choice of stimulus pulse duration or to curarization. (Author)

AD-620 753 Div. 16/1
ILLINOIS UNIV URBANA BIOPHYSICAL RESEARCH LAB
MUSCLE TWITCH TENSION, INFLUENCE OF ELECTRICAL STIMULATING CONDITIONS AT DIFFERENT TEMPERATURES. IV. TIME RATE OF RISE OF TENSION,
by Elizabeth Kelly, William J. Fry, and Francis J. Fry. 4 Nov 64, 10p.

Unclassified report

Pub. in Physics in Medicine and Biology v10 n3 p393-402 July 1965 (Copies available only to DDC users).

Descriptors: (*Muscles, Contraction), Amphibians, Transducers, Time, Nitrates, Chlorides, Musculoskeletal system, Temperature

Various arrangements for coupling whole frog sartorius muscles to transducers were investigated, with special attention to a configuration readily reproducible from one investigator to another and consistent with a minimum influence of the characteristics of the attachments on the recorded values of tension. An arrangement satisfying these two criteria was achieved, and the time rates of rise of tension observed at various temperatures were greater than those normally reported for other methods of attachment. The values of the times rates of rise of tension measured in chloride and nitrate Ringer's are considered in relation to basic muscle mechanisms.

AD-620 782 See Fld. 6/15

AD-620 784 Div. 16/1 ,16/12
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
PROCEDURE FOR SIMULTANEOUS INVESTIGATION OF THE NICTITATING CONDITIONED REFLEXES AND THE FUNCTIONAL STATE OF THE CARDIOVASCULAR SYSTEM IN MAN,
by F. M. Lebedev, and M. G. Kheyfets. 28 May 65, 10p. Rept. no. FTD-TT-65-60
TT , 65-63836

Unclassified report

Unedited rough draft trans. of Zhurnal Vysshei Nervnoi Deyatelnosti (USSR) v14 n2 p364-8 1964.

Descriptors: (*Central nervous system, Pathology), (*Cardiovascular system, Reflexes), (*Eye, Reflexes), Blood circulation, Stimulation, Conditioned reflex, Electrocardiography, USSR

Research was undertaken to study simultaneously the state of the central nervous system and the system of blood circulation in man under clinical conditions. An investigation of the nictitating conditioned reflexes and the functional state of the cardiovascular system in man was made. The equipment included: (a) a six-channel electrocardiograph with a set of standard pickups; (b) a protecting screen for isolating the sick person and including stimuli; (c) a special system for recording the inclusion of the stimuli and registering the position of the eyelid.

AD-620 788 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
COSMONAUTS PUT ON THE PRESSURE SUITS,
by A. Kikolaev. 12 Aug 65, 8p. Rept. no. FTD-TT-65-601
TT , 65-63840

Unclassified report

Unedited rough draft trans. of Sovetskaya Rossiya (USSR) 1960, 19 May, n. p.

Descriptors: (*Life support, Astronauts), Oxygen equipment, Pressure suits, Weightlessness. Acceleration tolerance, Anoxia, USSR

Problems of life support in space are reviewed briefly. The questions of weightlessness, acceleration tolerance, and food, water, and oxygen requirements are considered.

6/17. PROTECTIVE EQUIPMENT

AD-620 099 Div. 29/6
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
SPACE CLOTHING OF SUBJUGATORS OF OUTER SPACE,
by V. Krichagin. 18 Jun 65, 8p. Rept. no. FTD-TT-65-604
TT , 65-63335

Unclassified report

Unedited rough draft trans. of Meditsinskaya Gazeta (USSR) v28 p2 Mar 25 1965.

Descriptors: (*Pressure suits, Astronauts), (*Exposure suits, Astronauts), Space medicine, Space environmental conditions, Design, USSR

AD-620 198 Div. 29/6
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
PRELIMINARY EVALUATION OF MSA DILUTER DEMAND AN-R-5 REGULATORS. SERIAL NOS. 45-64 AND 45-67.
Research rept.,
by Martha E. Malone. 29 Jun 45, 9p. Rept. no. RR-1 ,NSAM-141
Proj. X601Av309f ,TED-UNL25200

Unclassified report

Descriptors: (*Oxygen masks, Military requirements), Oxygen equipment, Respiration, Hemoglobin, Oximeters, Aviation medicine, Tests

Two MSA AN-R-5 regulators were tested for performance. One of them, Serial No. 45-64 was found to have an internal leak. Consequently tests could not be made satisfactorily on the Aro Test Stand and a chamber experiment was not run on it. The other regulator, Serial No. 45-67, met the Navy requirements in the airoxygen ratio tests. The suction necessary for the tested flows of 45 and 70 lpm was very low; the maximum suction being .25 inches of water. Related to this was the finding that the demand valve did not reseat completely at the end of inhalation. When suction was released the demand valve remained open and there was a continuous leak. This was noted when testing the regulator in the laboratory and also while using it in the chamber. This regulator was also used at altitude in the low pressure chamber and the subject's hemoglobin oxygen saturation checked with a Coleman oximeter. The saturation remained normal throughout the run. (Author)

AD-620 203 Div. 29/6
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
PHYSIOLOGICAL TESTING OF MSA TYPE E EXPERIMENTAL OXYGEN MASK.
Research rept.,
by C. L. Gemmill, and C. H. Fugitt. 7 Jan 44, 20p. Rept. no. RR-1 ,NSAM-110
Proj. X277Av147a

Unclassified report

Descriptors: (*Oxygen masks, Military requirements), Physical properties, Respiration, High altitude, Temperature, Environmental tests, Oxygen consumption, Helmets, Eyeglasses, Exercise, Relaxation (Physiology), Aviation personnel, Aviation medicine

Physiological tests were made on the M.S.A. Type E Experimental Oxygen Mask. It was found that the allchamois lining mask fitted perfectly 86 out of 102 men during rest. This mask was comfortable. The other two types, part-chamois and no-chamois, gave a larger number of failures. They were not as comfortable as the all-chamois mask. There was good integration with 'the standard helmet

but not with the goggles. The supporting straps and holders are of poor construction. The upper lip strap stretches out of shape. There is a high resistance to expiratory flow. The mask has very good characteristics in the cold. (Author)

AD-620 303 Div. 29/6
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
EVALUATION OF CANADIAN MASK SIZE TEMPLATE FOR POSSIBLE USE IN FITTING A-14 OXYGEN MASKS.
Research rept. (final),
by C. L. Gemmill, and C. H. Fugitt. 6 May 44, 6p. Proj. X387Av210f
NAVMED , X-387 (Av-210-f)-1
Unclassified report

Descriptors: (*Oxygen masks, Measurement), Males, Face, Tests, Aviation medicine

Tests were made on 100 men with the Canadian template and with the fitting of the A-14 mask according to the template designation of each man. The men were typed according to the Wright Field Faces. The results showed that the large sized faces and the majority of the small sized faces were typed correctly. In the medium group, there were 16 failures in 74 men. Conclusions: The template for estimation of the mask sizes is a valuable instrument for an approximate extimation of the proper size of the large, medium or small mask on man. It is suggested that for the A-14 mask, the dividing line between the 'S' and the 'M' be increased 5 mm. in favor of 'S'. This change would move most of the failures in the medium group over into the small group. (Author)

AD-620 306 Div. 29/6
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
A PRACTICAL METHOD FOR CLEANING THE A-14 TYPE OXYGEN MASK,
by H. A. Smedal, E. B. Brown, C. E. Hoffman, and J. Daugherty. 1 Mar 46, 4p. Rept. no. NSAM-150
Proj. X679Av359s
NAVMED , X-679 (Av-359-s)-1
Unclassified report

Descriptors: (*Oxygen masks, Cleaning), Cleaning compounds, Germicides, Soaps, Water, Sprays, Atomization

A-14 oxygen masks were wiped and then sprayed with aqueous merthiolate (1:1000) following each use and were washed with mild soap and water following each fifth spraying. Sixty-one masks were used a total of 456 times or an average of 7.5 times during this tabulation. Fortythree of the masks were washed at least once during this time. Some of the masks were sprayed as many as 19 times and washed 3 times. This method of cleaning the A-14 mask proved to be practical. Spraying resulted in a more complete penetration of inaccessible parts of the mask interior, than is effected by wiping the inside of the mask with gauze saturated with merthiolate. The BuMed Supply Catalog stock atomizer (Holmspray throat and nasal atomizer No. 600) was suitable for this purpose. Thorough washing after each fifth spraying is necessary to remove crystals and solids which are not easily removed by wiping with gauze. Sticking of the exhalation valve which, in many cases, followed spraying the mask is not a serious problem since the valve is easily freed by a forced exhalation. (Author)

AD-620 307 Div. 29/6
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
EVALUATION OF MODIFIED POCKET TYPE OXYGEN MASK LEAK TESTER.
Research rept.,
by Royce K. Skow, and Burton E. Vaughan. 27 Mar 46, 18p. Proj. X698AV369s
Unclassified report

Descriptors: (*Oxygen masks, Gas detectors), (*Gas detectors, Performance (Engineering)), Analysis, Portable, Tests, Volume, Friction, Pressure

Two samples of a modified McKesson pocket type volumetric demand mask leak tester were evaluated from the point of view of their suitability as field type mask leak testers. Physical tests were made of leakage, friction, volume calibration, suction and pressure during volume expansion, disconnect leakage and separation force, the new closed position lock and the size and position of the new open circuit breathing vent. Calibration data were prepared relating bellows extension time and air leak volume to mask nitrogen in collected expired gas as determined by magnetic and chemical analysis. (Author)

AD-620 311 Div. 29/6
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
MODIFICATION OF BUAER M-117 DEMAND OXYGEN MASK LEAK TESTER.
Research rept.,
by Royce K. Skow, and Burton E. Vaughan. 15 May 46, 20p. Proj. X692AV365s
NAVMED , X692 (AV 365-s)-1
Unclassified report

Descriptors: (*Oxygen masks, Gas detectors), (*Gas detectors, Oxygen masks), Operation, Performance (Engineering), Aviation medicine

The BuAer M-117 pocket type demand mask leak tester was improved by the addition of an open circuit breathing vent. The design and advantages of this modification applied to pocket type testers is described. Necessary physical tests were made to develop data for calibration of bellows extension time in terms of per cent mask nitrogen and air leak volume. (Author)

AD-620 314 Div. 29/6
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
ACOUSTICAL EVALUATION: COMPARATIVE TESTING OF EXPERIMENTAL OXYGEN MASKS.
Research rept.,
by M. D. Steer, and M. Lawrence. 12 Apr 44, 17p. Rept. no. NSAM-158
Proj. X344Av189f ,X277Av147a
NAVMED , X-344 (Av-189-f)
Unclassified report

Descriptors: (*Oxygen masks, Acoustic properties), Barometric pressure, Atmospheric temperature, Intercommunication systems, Intelligibility, Noise, Aviation personnel, Tests, Tables

Three different models of experimental oxygen masks, MSA type E, and one type A-14 mask were tested and compared for acoustic response under experimentally controlled conditions of temperature and pressure. No significant differences were observed in the intelligibility scores of nochamois, part chamois and full chamois lined, MSA type E, experimental oxygen masks under the following conditions: Sea Level at 5F; 20,000 Feet at -5F; 28,000 Feet at -29F; 35,000 Feet at -42F. The average intelligibility for all three MSA type E masks tends to decrease from 80% at sea level and 20,000 feet to 74% at 28,000 feet, and to 69% at 35,000 feet. The type A-14 mask decreased in intelligibility from 74% at sea level to 57% at 35,000 feet. Three different models of experimental oxygen masks, MRS and the Baldwin perimental oxygen masks, MRS and the Baldwin mask were tested and compared for acoustic response at sea level. Average intelligibility scores for the Baldwin mask, MRS mask with chamois lining, MRS mask with suede lining and MRS mask with no lining indicate no significant differences. High internal variability in the scores indicate the need for further refinement in the testing conditions. (Author)

AD-620 688 Div. 29/6
CFSTI Prices: HC $3.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA ALTITUDE TRAINING UNIT
EVALUATION OF CERTAIN CHARACTERISTICS OF THE TYPE A-14 OXYGEN MASK WITH BAFFLES OVER THE MASK INLET PORTS.
Research rept.,
by Clayton S. White. 13 Aug 45, 53p. Rept. no. RR-1
Proj. X-584 (Av-302-f)
Unclassified report

Descriptors: (*Oxygen masks, Cold weather tests), Ice, Freezing, Moisture, Low-pressure research, High altitude

Certain characteristics of the A-14 oxygen mask with baffles were investigated in the laboratory and in the low Pressure Chambers under both normal and chill conditions at ground level and at simulated altitudes. Specifically investigated were: the effectiveness of the baffles in preventing freezing; the comfort of the mask; the likelihood of leakage of the mask.

7/1. CHEMICAL ENGINEERING

AD-620 565 Div. 4/1 ,4/3
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
PILOT PLANT PREPARATION OF DIBORANE.
Final rept.,
by H. W. Carhart, R. H. Blizzard, J. E. Johnson, J. A. Krynitsky, and S. H. Smith Jr., 17 Jan 49, 14p. Rept. no. NRL-3405
Unclassified report

Previously announced 19 Aug 53 as PB-97 405, LC mi$1.25, ph$1.25.

Descriptors: (*Diboranes, Synthesis (Chemistry)), Boron compounds, Hydrides, Production, Manufacture methods

A pilot plant comprising three independent production units was constructed for the preparation of diborane according to the following equation: 3 (LiBH4) + (BF3) (C2H5)2 (O) = (Ether) 2 (B2H6) + 3 (LiF) + (C2H5)2 (O). A total of 4.2 Kg of diborane of about 95 percent purity was prepared in forty-seven runs with an over-all yield of 90.9 percent based on the lithium borohydride. A production unit was essentially all glass and consisted of a reactor connected to suitable cold traps for purification and transfer of the product. The reaction was carried out under an inert atmosphere and transfers to storage bombs were made at reduced pressure. (Author)

AD-620 767 Div. 4/1 ,26/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
TO INTRODUCE MORE RAPIDLY AND TO ADOPT NEW POTENTIALS,
by Z. Nuriev. 20 Aug 65, 10p. Rept. no. FTD-TT-65-673
TT , 65-63824
Unclassified report

Unedited rough draft trans. from Pravda, Moscow (USSR) 28 Jul p2 1964.

Descriptors: (*Chemical industry, Industrial production), Management planning, Industrial plants, USSR

The article is concerned with the introduction and utilization of new potentials within the chemical industry of the USSR.

AD-620 768 Div. 4/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

METHOD OF EXTRACTING BORON FROM NATURAL BRINES,
by K. I. Khrennikov. 25 Aug 65, 6p. Rept. no. FTD-TT-65-494
TT , 65-63825

Unclassified report

Unedited rough draft trans. of Patent (USSR) 159 492, appl. no. 652269/23-4, 25 Jan 60.

Descriptors: (*Boron, Separation), Salts, Chemical precipitation, Patents, USSR, Solutions

The object of the invention is a method of extracting boron from natural brines. For a more thorough extraction of boron, the brine is treated with a mixture of lime with aluminum sulfates, or with salt of trivalent iron (for example, chloride, or sulfate), the deposited residue of hydrate of aluminum oxide of hydrate of ferric oxide is separated with absorbed boron from the mother liquor, the residue is processed with sulfuric acid or an iron sulfate solution to transform the boron into solution, and the boron is deposited from it by the known method. (Author)

7/2. INORGANIC CHEMISTRY

AD-620 141 Div. 4/2 ,25/7
CFSTI Prices: HC $1.00 MF $0.50
ARMY WEAPONS COMMAND ROCK ISLAND ILL RESEARCH AND ENGINEERING DIV
DETERMINATION OF NICKEL IN PHOSPHATIZING BATHS BY THE X-RAY SPECTROGRAPHIC TECHNIQUE.
Technical rept.,
by W. O. Crawford, and W. D. McHenry. 0 Jun 65, 18p. Rept. no. 65-1448
Proj. DA-1C024401A110

Unclassified report

Descriptors: (*Nickel, Chemical analysis), (*X-ray spectroscopy, Nickel), Phosphate coatings, Carbonates, Chemical precipitation, Zinc compounds, Manganese compounds

The purpose of the work was to develop a fast accurate method for the determination of nickel in phosphating baths. To accomplish this, basic nickel carbonate is known amounts was added to aliquots of phosphating solution. To prevent precipitation of solids during analysis, hydrochloric acid was added to the aliquots. A number of samples, taken from several different phosphating baths and stabilized in the manner described above, were subjected to X-ray spectrographic analysis for nickel. The results obtained from these analyses showed that the method described is a fast accurate method for the determination of nickel in phosphate baths. (Author)

AD-620 153 See Fld. 11/7

AD-620 156 See Fld. 6/12

AD-620 219 See Fld. 18/8

AD-620 327 Div. 4/2
CFSTI Prices: HC $1.00 MF $0.50
OREGON STATE UNIV CORVALLIS DEPT OF CHEMISTRY
THE LEWIS ACIDITY OF DIBORON TETRAFLUORIDE.
Technical rept.,
by John D. Hansen, and Theran D. Parsons. 16 Aug 65, 10p. Rept. no. TR-5
Contract Nonr128604 Proj. NR052 392

Unclassified report

Descriptors: (*Boron compounds, Fluorides), Chemical properties, Displacement reactions, Test methods, Chemical bonds, Chlorides, Ph

The stability of Lewis acid-base adducts of diboron tetrafluoride, boron trifluoride, and boron trichloride with various bases, and acid displacement reactions of the complexes are reported. It has been confirmed that boron trichloride is a stronger Lewis acid than boron trifluoride toward representative bases with both oxygen and nitrogen donor atoms. It has been established that diboron tetrafluoride is a weaker Lewis acid than boron trifluoride. Possible reasons for this difference are discussed. Good methods for the purification of boron trifluro de and boron trichlo ide are presented. (Author)

AD-620 531 Div. 4/2 ,4/4
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF PURE CHEMISTRY
COMBINATION REACTIONS OF HYDROXYL RADICALS IN THE FLASH PHOTOLYSIS OF WATER VAPOUR,
by J. Caldwell, and R. A. Back. 10 Nov 64. 8p. Rept. no. NRC-8414

Unclassified report

Pub. in Transactions of the Faraday Society, v61 n513 pt9 p1939-45 Sep 1965 (Copies available only to DDC users).

Descriptors: (*Water vapor, Decomposition), (*Photochemistry, Water vapor), Hydrogen, Oxygen, Vapor pressure, Reaction kinetics, Recombination reactions, Complex compounds, Canada

The yields of hydrogen and oxygen from the flash photolysis of water vapour were measured over a range of flash energy, water vapour pressure, and pressure of added inert gas. Relative rates of the two reactions, 20H ;M yields H2O2+M, and 20H yields H2O+O were estimated. These data were combined with earlier results of Black and Porter and of Del Greco and Kaufman to evaluate absolute rate constants for reaction (1) for a variety of third bodies. The magnitude of these constants supports the earlier suggestion that the first reaction proceeds through a M-OH complex. (Author)

AD-620 631 Div. 4/2 ,25/7
CHICAGO UNIV ILL LABORATORY OF MOLECULAR STRUCTURE AND SPECTRA
ELECTRONIC STRUCTURE OF CO AND BF.
Doctoral thesis,
by Winifred M. Huo. 18 Jan 65. 24p. Contract DA11ORD022 3119
AROD . 3835:8

Unclassified report

Pub. in Journal of Chemical Physics v43 n2 p624-47 Jul 15 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Carbon compounds, Monoxides), (*Boron compounds, Fluorides), (*Diatomic molecules, Molecular structure), Atomic orbitals, Field theory, Potential theory, Dipole moments, Operators (Mathematics), Electric fields, Electrons, Density

Single-determinantal self-consistent-field wavefunctions calculated by the expansion method are reported for the ground state of CO and BF. These calculations were performed at four different internuclear distances, including the experimental equilibrium internuclear distance. Exponents are optimized at all four distances. Potential curves and dipole-moment curves are obtained. From the potential curve, spectroscopic constants are calculated via the Dunham analysis. An SCF calculation was then performed at the calculated Re. Exponents are also optimized. Expectation values of a number of oneelectron operators, including the electric dipole moment, the gradient of the electric field at the nucleus, and the Hellmann-Feynman force, are presented and compared with experimental data available. Contour diagrams for the total charge densities and orbital charge densities are included. (Author)

AD-620 705 See Fld. 7/4

AD-620 724 See Fld. 18/4

7/3. ORGANIC CHEMISTRY

AD-620 126 Div. 4/3 ,14/8
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
METHOD OF PRODUCING ORGANOSILICON POLYMERS,
by V. B. Losev, S. V. Nadeeva, and V. V. Astakhin. 15 Jun 65, 5p. Rept. no. FTD-TT-65-194
TT , 65-63344

Unclassified report

Unedited rough draft trans. of Russian Patent 161920, pub. 29 Nov 62, appl. 805094/23-4.

Descriptors: (*Silicone plastics, Synthesis (Chemistry)), (*Synthesis (Chemistry), Silicone plastics), Amino plastics, Phenols, Silanes, Patents, USSR

Method of producing organosilicon polymers through the interaction of aminosilanes and phenols is presented.

AD-620 153 See Fld. 11/7

AD-620 154 See Fld. 11/9

AD-620 328 Div. 4/3
CFSTI Prices: HC $1.00 MF $0.50
OREGON STATE UNIV CORVALLIS DEPT OF CHEMISTRY
TRIFLUOROMETHYL-SUBSTITUTED BORANES. TRIFLUOROMETHYL DI-N-BUTYLBORANE AND TRIFLUOROMETHYLBORON DIFLUORIDE.
Technical rept.,
by Theran D. Parsons, James M. Self, and Lewis H.Schaad. 16 Aug 65. 11p. Rept. no. TR-4
Contract Nonr128604 Proj. NR052 392

Unclassified report

Descriptors: (*Organoboranes, Fluorides), (*Fluorine compounds, Boranes), Synthesis (Chemistry), Chemical properties, Stability, Decomposition, Catalysis, Spectra (Infrared), Vapor pressure

The preparation and properties of trifluoromethyl di-nbutylborane and trifluoromethylboron difluoride are reported. Loss of difluorocarbene from the trifluoromethyl group bonded to electron-deficient boron was observed in the presence of catalysts but in vacuo at room temperature the substances were stable for months. Infrared spectra and vapor pressure data for n-butylboron difluoride and di-n-butylboron fluoride are reported. (Author)

AD-620 476 Div. 4/3
MELLON INST PITTSBURGH PA
ORGANOSULFUR DERIVATIVES OF THE METAL CARBONYLS. VI. MONOMERIC CH3SFE (CO)2C5H5 AND RELATED COMPOUNDS,
by R. B. King, and M. B. Bisnette. 2 Nov 64. 7p.
Contract AF AFOSR580 64 Proj. 9710 Task 971002
AFOSR . 65-1132

Unclassified report

Pub. in Inorganic Chemistry v4 n4 p482-5 Apr 1965. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Organic sulfur compounds, Iron compounds), (*Iron compounds, Metalorganic compounds), (*Metalorganic compounds, Synthesis (Chemistry)), Spectra (Infrared), Nuclear magnetic resonance, Cyclopentanes, Chemical properties

Brown monomeric CH3SFe (CO)2C5H5 was obtained by the following 2 methods: (1) Treatment of a cold mixture of NaFe (CO)2C5H5 and (CH3)3CCl (i.e., C5H5Fe (CO)2H in situ) with dimethyl disulfide; (2) irradiation of (C5H5Fe (CO)2)2 with dimethyl disulfide at room temperature. Methyl iodide reacts readily with CH3SFe (CO)2C5H5 to give yellow crystalline ionic (C5H5Fe (CO)2S (CH3)2)I. Ethanolic mercuric chloride reacts with CH3SFe (CO)2C5H5 to form the orange adduct CH3SFe (CO)2C5H5.HgC12. On pyrolysis at 70 C CH3SFe (CO)2C5H5 readily loses carbon monoxide to form the previously reported dimeric (CH3SFeCOC5H5)2, for which an improved preparation from (C5H5Fe (CO)2)2 and dimethyl disulfide is also described. Treatment of di-t-butyl disulfide with Fe3 (CO)12 or (C5H5Fe (CO)2)2 gives red ((CH3)3CSFe (CO)3)2 or brown ((CH3)3CSFeCOC5H5)2, respectively. (Author)

AD-620 544 Div. 4/3 ,14/7 ,14/8
CFSTI Prices: HC $0.50 MF $0.50
COATING AND CHEMICAL LAB ABERDEEN PROVING GROUND MD
ANALYSIS OF POLYAMIDE AND AMINE ADDUCTRESINS.
Final rept.,
by James R. Keiser. 6 Aug 65, 11p. Rept. no. CCL-185
Proj. 1C025501A329

Unclassified report

Descriptors: (*Plastic coatings, Chemical analysis), (*Polyamide plastics, Chemical analysis), (*Amino plastics, Chemical analysis), Hydrolysis, Identification, Fatty acids, Epoxy plastics, Aging (Materials), Calalyst

Polyamide and amine adduct resins are widely used as co-reactants with epoxy resins in two-package coating systems. No methods for the analysis or characterization of polymers of this type appear in the literature. This report describes a method for hydrolysis of these curing agents that permits quantitative separation and identification of the fatty acid or dimer acid constituents. (Author)

AD-620 546 **See Fld. 11/10**

AD-620 562 **See Fld. 11/10**

AD-620 563 Div. 4/3 ,16/4
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
CHEMICAL STUDIES ON FUNGICIDES. PART III. SYNTHESIS OF ALPHA BROMOAMIDES.
Interim rept.,
by Warren E. Weaver, and Wilson M. Whaley. 26 Jul 48, 13p. Rept. no. NRL-3326

Unclassified report

Previously announced 7 Aug 50 as PB-100 905. LC mi$1.75 ph$2.50. See also PB-114 844.

Descriptors: (*Fungicides, Synthesis (Chemisty)), (*Bromine compounds, Fungicides), (*Amides, Fungicides), Amines, Halogenated hydrocarbons, Selection

Good methods for acylating in ethylene dichloride or in a two-phase system are presented. Forty-six compounds in two series, the alpha-bromoacetamides and the alphabromopropionamides, were synthesized and characterized preliminary to fungicidal evaluation. The importance of preparing series of compounds for fungicidal study is pointed out. (Author)

AD-620 565 **See Fld. 7/1**

AD-620 579 **See Fld. 11/7**

AD-620 591 Div. 4/3
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CHEMISTRY
STUDIES IN PHOSPHINEMETHYLENE CHEMISTRY. XI. THE REACTION OF ALKYLLITHIUM REAGENTS WITH TETRAPHENYLPHOSPHONIUM BROMIDE,
by Dietmar Seyferth, William B. Hughes, and James K.Heeren. 15 Apr 65, 6p.
AROD , 2832:23

Unclassified report

Pub. in Journal of the American Chemical Society v87 n15 p3467-74 Aug 5 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Phosphines, Chemical reactions), (*Lithium compounds, Chemical reactions), (*Organic phosphorus compounds, Synthesis (Chemistry)), Bromides, Polycyclic compounds, Metalorganic compounds

The reaction of methyllithium with tetraphenylphosphonium bromide in THF-ether medium was studied in some detail. The principal attack occurs at phosphorus and results in formation of triphen*ylphosphinemethylene, benzene, and lithium bromide. A portion (<20%)* of the attack by the lithium reagent involves abstraction of an ortho proton and leads to formation of 9-phenyl-9-phosphafluorene. Triphenylphosphineethylidene and triphenylphosphine-nbutylidene were prepared by the action of ethyllithium and n-butyllithium, respectively, on tetraphenylphosphonoim bromide, again via RLi attack at phosphorus. (Author)

AD-620 595 Div. 4/3 ,4/4
YALE UNIV NEW HAVEN CONN DEPT OF CHEMISTRY
1, 4 DEHYDROBENZENE: A STABLE SPECIES.
Revised ed.,
by R. Stephen Berry, Jon Clardy, and Margaret E.Schafer. 24 Feb 65, 11p. Contract AF AFOSR183 63 Proj. 9760 Task 976002
AFOSR , 65-1252

Unclassified report

Pub. in Tetrahedron Letters n15 p1003-10 1965 (Copies available only to DDC users). Revision of manuscript submitted 21 Dec 64.

Descriptors: (*Aromatic compounds, Free radicals), Mass spectroscopy, Optical properties, Decomposition, Molecular structure

The mass spectrum and the optical spectrum as functions of time were studied for the process and products of flashinitiated decomposition of benzenediazonium-4-carboxylate. The products of decomposition include a relatively stable C6H4 species, mass 76. The most likely assignment of the species is 1, 4-dehydrobenzene, probably in a singlet state. Two structural representations are proposed. (Author)

AD-620 604 Div. 4/3
CFSTI Prices: HC $1.00 MF $0.50
DEFENCE RESEARCH BOARD OTTAWA (ONTARIO)
ACTION OF PHTHALIC ANHYDRIDE ON TRIAMINORESORCIN: A NOTE,
by Mario Covello. 4 Aug 50, 5p.
TT ,AEC 65-63776; ,tr-243

Unclassified report

Trans. of Accàdemia delle Scienze Fiziche e Matematiche, Naples. Rendiconti (Italy) v33 (s3a) n9-12 p240-3 1927.

Descriptors: (*Phthalic acids; Anhydrides), (*Anhydrides, Chemical reactions), (*Organic nitrogen compounds, Chemical reactions), Resorcinol, Amines, Amides, Synthesis (Chemistry), Canada, Italy

Triaminoresorcin hydrochloride reacted with 3 moles of phthalic anhydride to yield H2O, HCl, and a condensation product which proved to be a phthalamide rather than the expected oxyquinone. This reaction product transformed itself into an unidentifiable resinous mass.

AD-620 621 Div. 4/3
TULANE UNIV NEW ORLEANS LA DEPT OF CHEMISTRY
PHOTOCYCLIZATION OF PROPENES TO CYCLOPROPANES; NOVEL PHENYL AND HYDROGEN MIGRATIONS IN PI,PI- SYSTEMS,
by G. W. Griffin, A. F. Marcantonio, H. Kristinsson, R. C. Petterson, and C. S. Irving. 28 Jun 65, 9p. Contract NIH GM11399
AROD , 4375:5

Unclassified report

Prepared in cooperation with Loyola Univ., New Orleans, La. Dept. of Chemistry. Pub. in Tetrahedron Letters n34 p2951-8 1965 (Copies available only to DDC users).

Descriptors: (*Alkenes, Photochemistry), Polycyclic compounds, Chemical bonds, Chemical reactions, Molecular isomerism

The photocyclization is reported of five phenyl-substituted propenes to cyclopropanes, demonstrating that the reaction is reasonably general. Cyclization is clearly associated with phenyl migration in three cases and with hydrogen migration in another.

AD-620 736 Div. 4/3
CFSTI Prices: HC $1.00 MF $0.50
REDSTONE SCIENTIFIC INFORMATION CENTER REDSTONE ARSENAL ALA
A PROCESS FOR PRODUCING SILANES,
by Goetz Koerner. 0 Jun 65, 10p. Rept. no. RSIC-430
TT , 65-63813

Unclassified report

Trans. of Patent (Germany) 1,162,365, pub. 6 Feb 64.

Descriptors: (*Silanes, Production), Synthesis (Chemistry), Alcohols, Phenols, patents, West Germany

The invention involves a process for producing silanes containing hydrogen as well as OR-groups attached to the silicon atom. Halosilanes containing SiH-groups are made to react with alcohols or phenols of the formula ROH, where R designates an alkyl or aryl radical without active hydrogen; furthermore, the process is characterized by the fact that the reaction is performed in the presence of an acid acceptor which is insoluble in the reaction mixture. The reaction may be performed in the presence of an inert solvent. (Author)

AD-620 755 **See Fld. 20/2**

AD-620 771 **See Fld. 11/9**

7/4. PHYSICAL CHEMISTRY

AD-620 112 **See Fld. 20/12**

AD-620 163 Div. 4/4 ,25/7
CFSTI Prices: HC $1.00 MF $0.50
PRINCETON UNIV NJ
RESEARCH ON DIELECTRIC PROPERTIES AND THE STRUCTURE OF MATTER.
Quarterly status rept. no. 37, 1 Apr-30 Jun 65,
by Charles P. Smyth. 30 Jun 65, 5p. Contract Nonr185809 Proj. NR-014 201

Unclassified report

Descriptors: (*Dielectric properties, Liquids), (*Molecular structure, Dielectric properties), Solutions, Cyclohexanes, Carbon tetrachloride, Ethylene oxide, Aromatic compounds, Carbon compounds, Sulfides, Chlorine compounds

A computer program based on a rigorous theoretical treatment was written and successfully used to calculate dielectric data. Samples of benzene, heptane, cyclohexane, toluene, dioxane, carbon

disulfide, carbon tetrachloride and tetrachloroethylene were carefully purified and their dielectric properties were measured at 2 mm. wavelength.

AD-620 205 See Fld. 10

AD-620 226 Div. 4/4
CFSTI Prices: HC $5.00 MF $1.00
RENSSELAER POLYTECHNIC INST TROY N Y DEPT OF CHEMISTRY
AN INVESTIGATION OF SOME REACTIONS OF ACTIVE NITROGEN.
Doctoral thesis,
by David R. Safrany. 0 Jun 64, 186p. Contract AF-AFOSR-174-63 Proj. 9760 Task 976003 AFOSR , 65-1337

Unclassified report

Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only.

Descriptors: (*Nitrogen, Chemical reactions), Atomic energy levels, Excitation, Catalysis, Mass spectroscopy, Reaction kinetics, Hydrocarbons, Degradation

The reactions of active nitrogen were studied in a fast-flow, low-pressure system using a mass spectrometer whose leak was located directly downstream from the reaction zone. Reactions of metastable N2 (A3ξ (+)u) molecules, produced by means of surface catalyzed excitation, were also studied. The results of the excited molecule experiments indicated that, in general, N2 (A3ξ (+)u) molecules do not play a major role in the reactions of active nitrogen with inorganic and organic substances such as: O2, O3, N2O, C2H2 and C2H4. The reactions of N-atoms with hydrocarbons were studied along the lines of previous workers. It was found that, contrary to earlier work, HCN is not the only major nitrogencontaining product formed, but N2 is also a substantial product. Under certain conditions, NH3 and CH3CN can also be major products. Ammonia added to the flame zone of the C2H2-active nitrogen reaction was found to react with CH radicals formed, yielding HCN. A general degradation mechanism is proposed involving the attack of the hydrocarbon, in general, by a radical other than the N-atom as the initial step. (Author)

AD-620 231 See Fld. 14/2

AD-620 293 Div. 4/4
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
QUASILINEARIZATION AND THE ESTIMATION OF CHEMICAL RATE CONSTANTS FROM RAW KINETIC DATA,
by R. Bellman, J. Jacquez, R. Kalaba, and S. Schwimmer. 0 Aug 65, 14p. Rept. no. RM-4721-N1H
Contract PHS GM09608 04

Unclassified report

Descriptors: (*Reaction kinetics, Nonlinear systems), (*Boundary value problems, Reaction kinetics), Nonlinear differential equations, Numerical analysis, Gases, Oxygen, Nitrogen, Experimental data

A technique for estimating chemical rate constants from raw kinetic data is suggested. Such problems are viewed as nonlinear multi-point boundary value problems for systems of nonlinear ordinary differential equations, for which the quasilinearization procedure offers an effective means of numerical solution. The method is illustrated using kinetic data, obtained by Bodenstein and Lindner, on some gas phase reactions of nitrogen and oxygen. (Author)

AD-620 296 See Fld. 10/3

AD-620 339 Div. 4/4
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
THE WETTING OF GOLD AND PLATINUM BY WATER.
Interim rept.,
by K. W. Bewig, and W. A. Zisman. 10 Aug 65, 10p. Rept. no. NRL-6311
Proj. RR001 01 43 4751

Unclassified report

Descriptors: (*Gold, Surface properties), (*Platinum, Surface properties), Contamination, Gases, Purification, Water

When a sessile drop of pure water is placed on a clean surface of pure polished gold or platinum, it will spread spontaneously over the metal and exhibit a zero contact angle. However, in order to rid surfaces of these metals of adsorbed hydrophobic contaminants, it is necessary to heat them to white-hot temperatures in flowing streams of high-purity hydrogen, nitrogen, argon, krypton, or air. Such a treatment gives surfaces which are completely wetted by pure water and exhibit zero contact angles in gases freed from trace contaminants by an adsorbent cold trap. However, prolonged exposure of the metals to these gases renders them nonwetting because of the gradual adsorption of trace hydrophobic contaminants present in the gas streams. (Author)

AD-620 346 See Fld. 3/1

AD-620 365 Div. 4/4
COLUMBIA RADIATION LAB NEW YORK
DEVIATION FROM THE 1/R TO THE 6TH POWER POTENTIAL IN THE SCATTERING OF A POLAR MOLECULE BY NONPOLAR GASES.
Technical rept. (Revised ed.),
by M. M. Hessel, and P. Kusch. 9 Apr 65, 3p.
Rept. no. TR-20
Contract Nonr26645 ,DA28 043AMC00099E
Proj. NR014 302

Unclassified report

Pub. in Journal of Chemical Physics v43 n1 p305-6 Jul 1 1965 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 8 Dec 64.

Descriptors: (*Molecules, Scattering), (*Potential theory, Molecules), Kinetic theory, Gases, Molecular beams, Attenuation

AD-620 424 Div. 4/4 ,25/7 ,25/2
CFSTI Prices: HC $1.00 MF $0.50
FRICK CHEMICAL LAB PRINCETON UNIV N J
PHYSICAL, CHEMICAL AND OTHER PROPERTIES OF MOLECULES AND CRYSTALS.
Periodic status rept. no. 16, Feb-30 Apr 65,
by George E. Leroi. 30 Apr 65, 2p. Contract Nonr185827 Proj. NR014 203

Unclassified report

Descriptors: (*Molecular properties, Reports), (*Crystallography, Reports), Molecular spectroscopy, Raman spectroscopy, Physical properties, Chemical properties, Phase studies

Information is given on the presentation and publication of papers on physical, chemical, and other properties of molecules and crystals.

AD-620 425 Div. 4/4 ,25/7
CFSTI Prices: HC $1.00 MF $0.50
ROCHESTER UNIV N Y
STATUS OF RESEARCH PROBLEMS.
Status rept. no. 26,
by A. B. F. Duncan. 1 Jul 65, 1p. Contract Nonr66815 Proj. NR014 107

Unclassified report

Descriptors: (*Benzene, Absorption spectrum), (*Sulfur compounds, Fluorescence), (*Carbon compounds, Absorption spectrum), Temperature, Molecular spectroscopy, Electron transitions, Vibration, Oxides, Dioxides

ABSORPTION SPECTRUM OF BENZENE IN THE 2000A REGION: Temperature dependence of vibrational transitions in the second electronic transition of benzene was studied. All the vibrational levels observed by Pickett (L. W. Pickett, et al. J. Am. Chem. Soc., 73:4862 (1951)) showed that absorption at a wave length corresponding to the longest wave length transition (from the normal state to an excited level of the second electronic state), with absorption by a constant number of molecules, decreased slightly with increase in temperature because of depopulation of the normal state. At wavelengths longer than the Pickett transition, intensity increases with increase in temperature. LIFETIME OF FLUORESCENCE OF SO2: Transitions in the 3800-5000A region of the emission spectra of SO2 come from the first excited electronic state to vibrational levels of the normal state. ELECTRONIC SPECTRUM OF CARBON SUBOXIDE. A background source for the absorption spectrum was constructed. The vacuum line for preparation and purification of C302 is being assembled.

AD-620 443 See Fld. 20/12

AD-620 461 See Fld. 14/5

AD-620 466 Div. 4/4 ,25/4
CFSTI Prices: HC $1.00 MF $0.50
HEBREW UNIV JERUSALEM (ISRAEL) DEPT OF PHYSICS
X-RAY EXCITATION OF FLUORESCENCE.
Progress rept. no. 1, 1 Mar-30 Jun 65,
by W. Low. 30 Jun 65, 4p. Contract N62558 4347

Unclassified report

Descriptors: (*Fluorescence, X-rays), (*X-rays, Fluorescence), Crystals, Aluminum compounds, Oxides, Shielding

An X-rayed crystal of Al203 was heated to a fairly high temperature where it emitted a very strong R line radiation of very large intensity. This may result from radiation centers that have been caused by the X-ray radiation transferring their energy to the levels of the R line or a reconversion from a different valence state such as Cr2+ into Cr3+. A special lead-shielded box was designed for placing over the X-ray tube and the spectrometer in order to provide protection from the X-rays scattered over a large angle.

AD-620 477 See Fld. 20/2

AD-620 531 See Fld. 7/2

AD-620 552 See Fld. 10/3

AD-620 595 See Fld. 7/3

AD-620 630 Div. 4/4 ,25/7
OHIO STATE UNIV COLUMBUS DEPT OF CHEMISTRY
ELECTRON-IMPACT SPECTRA,
by Ausma Skerbele, and Edwin N. Lassettre. 12 Aug 64, 7p. Contract AF19 604 3078 Grant ,AF AFOSR 61 63
AFOSR , 65-1103

Unclassified report

Pub. in Journal of Chemical Physics v42 n1 p395-401 Jan 1 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Electron bombardment, Spectroscopy), (*Atomic energy levels, Excitation), Nitrogen, Carbon compounds, Monoxides, Water vapor, Ammonia, Aromatic compounds, Scattering, Electron transitions

Electron-impact spectra at zero scattering angle were obtained for nitrogen, carbon monoxide, water, ammonia, and benzene. Vibrational structure was resolved for the a-1 pi-g state in nitrogen and two Rydberg transitions in water spectra. The results were compared with ultraviolet absorption data. (Author)

AD-620 705 Div. 4/4 ,4/2 ,2/7
LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF PHYSICAL SCIENCES LAB
EXCITATION OF ELECTRONIC LEVELS OF SODIUM BY VIBRATIONALLY EXCITED NITROGEN,
by Walter L. Starr. 12 Jan 65, 3p. Contract NOw63 0050
Unclassified report

Pub. in Journal of Chemical Physics v43 n1 p73Jul 1. 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Sodium, Excitation), (*Atomic energy levels, Excitation), (*Nitrogen, Glow discharges), Atomic orbitals, Resonawce, Emissivity, Microwaves, Line spectrum, Diatomic molecules, Vibration, Luminescence, Quenching (Inhibition)

The excitation of electronic states of sodium by vibrationally excited nitrogen N2 (2+) was demonstrated experimentally. The NB (2+) was produced in the afterglow of a microwave discharge in flowing N2 (2+). Identification of N2 (2+) as the source of the sodium excitation was accomplished by the selective removal of N2 (2+) from the afterglow by deactivation with N2O and by observation of the concurrent disappearance of sodium line emission. It is concluded that the observed excitation is representative of a general phenomenon whereby the electronic states of atoms can be excited by the transfer of vibrational energy from diatomic molecules. The results verify the generally assumed mechanism for the quenching of sodium resonance radiation by nitrogen. (Author)

AD-620 717 See Fld. 20/13

AD-620 734 See Fld. 11/9

8/2. CARTOGRAPHY

AD-620 242 See Fld. 3/1

AD-620 400 Div. 2/4
CFSTI Prices: HC $3.00 MF $0.75
OHIO STATE UNIV COLUMBUS
ESTABLISHMENT OF A FIRST ORDER TRIANGULATION NETWORK AT THE OHIO STATE UNIVERSITY.
Master's thesis.
by Jack Andrew Cook Jr.. 01965, 83p. Contract AF33 608 1095
Unclassified report

Descriptors: (*Surveying, Geodesics), Terrain, Least squares method, Errors, Ohio

Three geodetic control points and an isolated baseline were taken and brought together into a first-order triangulation system. This system can be classified only first-order within itself since the starting coordinates of STATE and PHYSICS are at best a high second-order value. The Department of Geodetic Science at the Ohio State University now has this small scale first-order net for use in continuing geodetic work in triangulation, trilateration, and gravity surveying. Coordinates are furnished for all points in three systems, the City of Columbus Survey, the Ohio State-Plane Coordinate, and geographic positions used primarily by the United States Coast and Geodetic Survey.

AD-620 416 See Fld. 9/1

AD-620 417 See Fld. 9/1

AD-620 418 Div. 2/4 ,13/4 ,25/4
CFSTI Prices: HC $3.00 MF $0.75
OHIO STATE UNIV COLUMBUS
AN INVESTIGATION OF SHORT LINE TRIANGULATION ACCURACIES COMBINED WITH THE FIELD TESTING OF A KERN DKM-3 MODIFIED WITH A 5-WIRE RETICULE.
Master's thesis.
by Darwin Gene Abby. 01965, 62p. Contract AF33 608 1095
Unclassified report

Descriptors: (*Theodolites, Surveying), (*Surveying, Theodolites), Reticles, Optical instruments, Geodesics, Position finding

The objective of this paper is to study the problems and procedures of short line triangulation, and to test the 5-wire reticule in the DKM-3 theodolite. This investigation is designed to be a field test. No attempt was made to evaluate the accuracy of the theodolites under laboratory conditions as this has been done many times. (Author)

AD-620 520 See Fld. 3/1

AD-620 646 See Fld. 8/14

8/6. GEOGRAPHY

AD-620 208 Div. 2/5 ,2/10
CFSTI Prices: HC $1.00 MF $0.50
DIRECTORATE OF SCIENTIFIC INFORMATION SERVICES OTTAWA (ONTARIO)
STUDY OF THE EARTH'S CRUST BY SEISMIC METHODS,
by I. P. Kosminskaya. 0 Jun 65, 10p. Rept. no. T-426-R
TT , 65-63354
Unclassified report

Trans. of Akademiya Nauk SSSR. Vestnik, v35 n2 p51-7 1965.

Descriptors: (*Lithosphere, Seismology), (*Seismology, Lithosphere), Scientific research, Geophysics, USSR

AD-620 209 See Fld. 8/14

AD-620 210 See Fld. 8/14

AD-620 394 See Fld. 4/2

AD-620 571 Div. 2/5
CFSTI Prices: HC $2.00 MF $0.50
AIR FORCE CAMBRIDGE RESEARCH LABS BEDFORD MASS
GIANT DESICCATION POLYGONS OF GREAT BASIN PLAYAS.
Environmental research paper,
by James T. Neal. 0 Aug 65, 45p. Rept. no. AFCRL-65-575 ,ERP-123
Proj. 8623 Task 862302
Unclassified report

Descriptors: (*Geology, Terrain), Lakes, Evaporation, Deserts, Configurations, Soil mechanics, Structural geology, Photogeology

Giant desiccation fissures observed on 39 playas (dry lakes) in the Great Basin are greater in size and causative rupture stress than are the typical, small, surface mud cracks. Giant open fissures may be a meter wide and more than 5 m deep, whereas the typical shallow mud cracks are a few centimeters wide and about 25 cm and more deep. The fissures form polygonal patterns that range from 15 to 100 m and more across, with intersections predominantly at approximately right angles. The fissures themselves follow sinuous, irregular lines. Thus, the patterns are for the most part 'irregular random orthogonal polygons'. The fissures form on hard, dry, compact playa crusts where desiccation has been rigorous and ground water is fairly deep. The contractive stress producing the fissures results from loss of moisture and appears to develop over a period of several years; however, the rupture probably takes place in minutes. The greatest release of stress frequently appears to occur below the surface. Tectonic forces and basin subsidence may be a factor in fissure formation. Fissures follow a cycle of growth and destruction: fresh, sediment filled, vegetated, and relict fissures comprise the major geomorphic forms. The patterns can be easily identified on airphotos, and can thus, through inference, offer reconnaissance information on the playa environment. (Author)

AD-620 799 See Fld. 4/2

8/7. GEOLOGY AND MINERALOGY

AD-620 209 See Fld. 8/14

AD-620 210 See Fld. 8/14

8/9. MINING ENGINEERING

AD-620 166 Div. 17/1 ,26/1 ,26/5
CFSTI Prices: HC $6.00 MF $1.25
IIT RESEARCH INST CHICAGO ILL TECHNOLOGY CENTER
A PROTOTYPE MANUAL OF METALLURGICAL PRACTICE.
Final rept.,
by David W. Levinson, Harry Schwartzbart, Robert F. Domagala, and Donald P. Grover. 0 Mar 65, 241p. Rept. no. IITRI-B6018-1
Contract OCD PS64 50 Proj. IITRI-B6018
Unclassified report

Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only.

Descriptors: (*Metallurgy, Instruction manuals), Metals, Alloys, Identification, Heat treatment, Material forming, Furnaces, Joining, Small tools

A manual of metallurgical practice has been prepared to serve an educational function for nonprofessionally trained laymen in a post-attack situation. For purposes of this manual it is assumed that normal fabrication facilities and trained metallurgists are unavailable. Since intelligent utilization of available metals will be a matter of some practical importance, it will be most helpful to gain guidance from this document which provides information on applications of metals and alloys, identification and recognition, methods of varying the properties, shaping and joining, tool design, and furnace construction. (Author)

AD-620 188 See Fld. 11/6

AD-620 238 See Fld. 11/6

AD-620 241 See Fld. 11/6

AD-620 264 See Fld. 11/6

AD-620 559 See Fld. 13/8

AD-620 589 See Fld. 11/6

AD-620 790 Div. 17/1

Descriptors: (*Ocean waves, Magnetic properties), (*Marine geophysics, Terrestrial magnetism), (*Terrestrial magnetism, Marine geophysics), Magnetic fields, Magnetohydrodynamics, Inductance, Mathematical models

The magnetic field induced by the motion of ocean waves across the earth's magnetic field is derived by a simpler and more direct method than that used by previous authors. The solutions for the field both within and above the sea are found. They are exact expressions, reducing to those calculated in previous papers when certain approximations are made. In contrast to earlier work where only the magnetic effects of wind driven waves were considered, the importance of ocean swell in generating significant magnetic fields is stressed. In particular it is shown that even when the sea-state is slight, the presence of longperiod swell can give rise to magnetic field variations whose magnitude is as large as that produced by the shorter-period wind waves of a rough sea. For instance, an ocean swell of 20 sec period and only 10 cm amplitude induces a magnetic field of 0.2 gamma at a depth of 100 m below the surface and a field of 0.1 gamma at an altitude of 50 m above the sea. (Author)

AD-620 372 Div. 2/6
AIR FORCE CAMBRIDGE RESEARCH LABS BEDFORD MASS
SPHERICAL HARMONIC ANALYSIS. 2. A NEW MODEL DERIVED FROM MAGNETIC OBSERVATORY DATA FOR EPOCH 1960.0.
Environmental research papers (Revised ed.),
by Paul F. Fougere. 2 Dec 64, 18p. Rept. no. AFCRL-65-465 ,ERP-114
Proj. 7601 Task 760105

Unclassified report

Pub. in Journal of Geophysical Research, v70 n9 p2171-9 May 1 1965. (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 13 May 64.

Descriptors: (*Terrestrial magnetism, Harmonic analysis), (*Harmonic analysis, Terrestrial magnetism), Magnetic fields, Vector analysis, Magnetism, Mathematical models

A new method of spherical harmonic analysis was applied to the annual mean of vector magnetic data from 82 observatories for epoch 1960.0. The resulting model of the geomagnetic field, containing 77 Gaussian coefficients, fits the observatory data with an rms error of 358 gammas, the project Magnet data to 394 gammas, and the Vanguard satellite data to 54 gammas. For comparison, corresponding figures were obtained for 10 other published field models. Results for all models were obtained with and without an epoch correction using the Nagata and Oguti time derivative Gaussian coefficients. (Author)

AD-620 464 Div. 2/6 ,2/7
CFSTI Prices: HC $2.00 MF $0.50
SPACE SCIENCES LAB UNIV OF CALIFORNIA BERKELEY
AURORAL ZONE PEARL PULSATIONS,
by R. L. McPherron, and S. H. Ward. 30 Jun 65, 50p. Rept. no. series no. 6 issue no. 23
Contract Nonr22289 Grant ,NSF GP1775

Unclassified report

A contribution to the IQSY.

Descriptors: (*Aurorae, Terrestrial magnetism), (*Terrestrial magnetism, Aurorae), (*Atmospheric sounding, Aurorae), Electron density, Bremsstrahlung, Magnetic storms, Magnetohydrodynamics, Geophysics, Meteorological balloons, Radiation measurement systems

During the period August 16 to September 20, 1964, magnetic micropulsations were continuously recorded at Flin Flon, Manitoba, geomagnetic coordinates (63.6 N, 314.8). The purpose of these recordings was to obtain information on the characteristics of micropulsations at these latitudes and examine the possibility of a relationship of micropulsations to electron precipitation. Simultaneous information on electrons was obtained from a number of high altitude balloon flights carrying x-ray detectors. (Author)

AD-620 494 Div. 2/6 ,25/5
BELFER GRADUATE SCHOOL OF SCIENCE YESHIVA UNIV NEW YORK
BOOTSTRAP GRAVITATIONAL GEONS,
by Arthur Komar. 2 Sep 64, 7p. Contract AF AFOSR509 64 Proj. 9751 Task 975103
AFOSR , 65-1068

Unclassified report

Pub. in Physical Review v137 n2B pB462-6 Jan 25 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Gravity, Relativity theory), Field theory, Topology, Partial differential equations

It is shown that there exist solutions of the vacuum Einstein field equations with the property that exterior to the Schwarzschild radius, R = 2m, the solution appears to be that of a static spherically symmetric particle of mass m, whereas interior to the Schwarzschild radius the topology remains Euclidean and the solutions have the property of a bundle of gravitational radiation so intense that the mutual gravitational attraction of the various parts of the bundle prevent the radiation from spreading beyond the Schwarzschild radius. It is not known whether there exist solutions of this type which remain nonsingular for all times; however, no singularity can ever be observed exterior to the Schwarzschild radius. The Cauchy data for one such solution are explicitly exhibited. (Author)

AD-620 646 Div. 2/6 ,2/10 ,2/4
LAMONT GEOLOGICAL OBSERVATORY PALISADES N Y
SEMI-DIURNAL EARTH TIDAL COMPONENTS FOR VARIOUS EARTH MODELS.
Scientific rept. no proj. VELA-UNIFORM,
by L. E. Alsop, and J. T. Kuo. 0 Feb 65, 20p. Rept. no. SR-42 ,744
Contract AF19 604 7376 Grant ,NSF GP977
Proj. 8652 ,ARPA order 292 Task 865203
AFCRL , 65-259

Unclassified report

Pub. in Communications n236 de l'Observatoire Royal de Belgique. Serie Geophysique n69 p1-15 nd. Symposium International sur les Marees Terrestres (5th). (Copies available only to DDC users).

Descriptors: (*Earth models, Geodesics), (*Geodesics, Earth models), (*Gravity, Periodic variations), Geophysics, Earth, Elasticity, Deformation, Seismology

This study of the elastic deformation of the earth due to tidal-generating potentials attempts to evaluate the possible cause for the discrepancy between the accumulated observational data of earth tides for the principal semi-diurnal tidal constituent, M sub 2, and the theoretical values. The characteristic numbers, h, k, and l of the earth are calculated for earth models consisting of velocities due to Jeffreys or Gutenberg with Bullen A or Bullen B density distribution. The computations were made using a modification of an earlier program for an IBM 7090 written for calculating the free periods of the earth. The characteristic numbers of the earth are nearly independent: (1) of the presence of the solid inner core for a wide range of the possible values of the outer core rigidity; (2) of either the Jeffreys or the Gutenberg velocity models, i.e., of the presence or absence of a low velocity channel in the upper mantle. A comparison of the theoretical gravimetric factors G calculated for a continental and an oceanic earth model with the observed gravimetric factors of the semidiurnal tidal constituent, M sub 2, obtained principally during the International Geophysical Year indicates that the differences in the observed values of G appear to be primarily due to the effects of the ocean and only secondarily to differences in the variation of the crustal structures. (Author)

AD-620 776 Div. 2/6
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
METHOD OF MEASURING THE VERTICAL GRADIENT OF GRAVITATIONAL FORCE,
by V. N. Stadnichenko. 12 Aug 65, 6p. Rept. no. FTD-TT-65-635
TT , 65-63833

Unclassified report

Unedited rough draft trans. of Russian Patent 172 671, pub. 22 Mar 63, appl. no. 826474/26-10.

Descriptors: (*Gravity, Measurement), Buoyancy, Patents, USSR

A method of measurement is proposed of the vertical gradient of the force of gravity with the aid of a system of weights arranged at different heights, which has the distinguishing feature that for the purpose of increasing the precision of the measurements, two weights the upper one of which has positive buoyancy and the lower one negative, rigidly joined one with the other, are placed in a liquid and the change in the vertical gradient in measured by the change in the buoyancy of the system.

9/1. COMPONENTS

AD-620 111 See Fld. 14/2

AD-620 121 Div. 8/4
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
EXPERIMENTAL GENERATION OF AN ELECTRON BEAM BY A HOLLOW COLD CATHODE,
by V. A. Zrazhevskii. 1 Jun 65, 6p. Rept. no. FTD-TT-65-164
TT , 65-63339

Unclassified report

Unedited rough draft trans of Avtomaticheskaya Svarka (USSR) v17 n7 p91-1 1964. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Electron beams, Cold cathode tubes), (*Cold cathode tubes, Electron beams), Electric discharges, USSR

AD-620 122 Div. 8/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
GENERATOR OF PERIODIC SEQUENCE OF BUNDLES OF SQUARE PULSES,
by Yu A. Leibman. 3 Jun 65, 8p. Rept. no. FTD-TT-65-177
TT , 65-63340

Unclassified report

Unedited rough draft trans. of Russian patent 156185, pub. 23 Mar 62, appl. 722800/26, 4p. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Pulse generators, Digital systems), USSR, Patents, Circuits, Feedback, Commutators

The object of the invention is a generator of periodic sequence of bundles of square pulses with regulatable length and intervals between them which contains a master generator connected up to a conversion system controlling a shaping trigger and a feedback circuit which serves for dropping (throwing out) the count. For the purpose of shaping a series of pulses with mutually independent length of the pulses and the intervals between them issuing into one or several channels, and the simplification of the distribution of the pulses over

the channels, in it there is used a commutating register and pairs of systems of matching connected up to it the number of which is equal to the number of independently regulatable pulses and intervals between them, with the outputs of each pair of systems of matchings connected up through systems 'ILI' to one shaping trigger, and in the distribution of the pulses over the different channels the outputs of each pair of systems of matchings are connected up to separate shaping triggers. (Author)

AD-620 132 Div. 8/4
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
A CATHODE-RAY STORAGE TUBE.
by Z. G. Petrenko, L. I. Ionova, and N. V. Zelenskai. 27 May 65, 6p. Rept. no. FTD-TT-65-486 TT , 65-63350
Unclassified report

Unedited rough draft trans. of Russian patent 159193, pub. 3 Oct 62, appl. 801251/26-9, 2p.

Descriptors: (*Storage tubes, Cathode ray tubes), (*Cathode ray tubes, Storage tubes), Image tubes, Design, Patents, USSR

The proposed cathode-ray storage tube differs from existing tubes with a visible potential relief by the possibility of obtaining not only a visible light signal which is stored for an extented period, but also its electrical analog. This is accomplished by using a target operating in an image iconoscope regime and introducing a readout gun.

AD-620 157 See Fld. 14/2

AD-620 267 Div. 8/2 ,20/6
CFSTI Prices: HC $2.00 MF $0.50
HP ASSOCIATES PALO ALTO CALIF
SEMICONDUCTOR MATERIALS.
Interim engineering rept. no. 5, 15 Apr-15 Jul 65, 15 Jul 65, 41p. Contract NObsr89489 Proj. SR008 0301 Task 9475
Unclassified report

See also AD-608 536.

Descriptors: (*Semiconductors, Electroluminescence), (*Electroluminescence, Display systems), (*Display systems, Diodes (Semiconductor), Gallium alloys, Arsenic alloys, Phosphous alloys, Emissivity, Optical properties, Integrated circuits

The purpose and an outline of the planning of the renewed program for developing a display based upon a matrix array of GaAs (1-x)Px injection electroluminescent pn junction diodes is presented. A general analysis of the function of displays leads to an estimate of man's biological limit on processing visual sensory input information. A brief survey of current technology shows that the most promising future technology is a combination of modern integrated circuits with efficient light sources. The most likely candidate for such a combination are injection electroluminescent diodes, which represent the light source most compatible with integrated circuits. An analysis of the cross-grid problem for the case of the light-voltage and lightcurrent characteristics of el diodes indicates that an ideal el diode with a vanishingly small bulk (series) resistance would not be subject to the cross-grid limitations of resistive and capacitive el elements and would provide satisfactory picture contrast when driven in a dot sequential scanning mode for panels containing 100,000 - 1,000,000 picture elements. (Author)

AD-620 299 Div. 8/2 ,30/2
CFSTI Prices: HC $6.00 MF $1.50
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF
DISCONTINUOUS OPERATION OF LINEAR FEEDBACK CONTROL SYSTEMS.
Doctoral thesis,
by Farel M. Parapat. 01964, 299p.
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Control systems, Feedback), (*Servomechanisms, Switching circuits), Relays, Computers, Differential equations, Linear systems

Several methods to decrease the time response of feedback control systems have been developed. A relatively easy method for decreasing the total time response is introduced. The method can be applied to linear position control system of any order. The systems may have real poles, real zeros, complex poles and complex zeros, as long as there is freedom to have one kind of switch between elements, and another kind of switch to inject signals into the elements during certain intervals of time. Application of the method to systems with ramp input and effects of some nonlinear components are also investigated. The switching computer required to operate the switches is very simple; the switches can be opened and closed at the right time, by comparing the input signal to the output signal in the switching computer; the output velocity signal may be required to increase the sensitivity of the switching computer. For any system of any order, the same components of the switching computer can be applied. (Author)

AD-620 318 See Fld. 20/6

AD-620 330 Div. 8/4
CFSTI Prices: HC $2.00 MF $0.50
ARMY ELECTRONICS COMMAND FORT MONMOUTH NJ
EVALUATION OF A LOW-DRAIN NUVISTOR OSCILLATOR AMPLIFIER TRIODE.
Technical rept.,
by W. G. Muessle. 0 Jul 65, 32p. Rept. no. ECOM-2604
Proj. 1P6 22001A055 Task 1P6 22001A055 02
Unclassified report

Descriptors: (*Triodes, Miniature electron tubes), Performance (Engineering), Noise (Radio), Gain, Admittance, Voltage, Radiofrequency power, Modulation, Radiofrequency amplifiers, Radiofrequency oscillators

The A-15496 nuvistor triode was evaluated to determine its capabilities for military application. Data are presented for static characteristics, voltage gain, noise figure, input admittance, cross modulation, and rf power output. (Author)

AD-620 359 See Fld. 17/7

AD-620 379 Div. 8/4 ,5/4
CFSTI Prices: HC $4.00 MF $0.75
HUGHES AIRCRAFT CO OCEANSIDE CALIF VACUUM TUBE PRODUCTS DIV
RESEARCH AND DEVELOPMENT OF TWO-COLOR DIRECT VIEW STORAGE TUBE WITH SELECTIVE ERASURE.
Final engineering rept. for 24 Jun 63-23 Apr 65, by P. P. Damon. 0 May 65, 101p. Contract NObsr89452 Proj. SR00 80301 Task 9459
Unclassified report

See also AD-611 559.

Descriptors: (*Storage tubes, Color), (*Display systems, Storage tubes), Fluorescent screens, Brightness, Viewing screens, Phosphorescent materials, Zinc compounds, Cadmium compounds, Silicates, Sulfides, Electron tube parts, Electron guns, Electron optics, Information retrieval

A direct view storage tube has been developed which is capable of displaying stored information in either of two colors or in intermediate hues, and selectively erasing that information. The operating principle is based on the fact that flood electrons, which pass through holes in the storage mask when the storage surface potential is near cutoff, fall within small areas on the viewing screen opposite the storage mask holes; whereas flood electrons which pass through the holes when the potential is near its minimum, (i.e., flood gun cathode potential), fall on larger overlapping areas of the viewing screen. The viewing screen consists of two phosphors: one occupies small areas in register with the storage-mask holes, while the other occupies areas surrounding the first. Included in this report are results of the twentyfive tubes constructed during the program. A tabulation of actual performance versus objective performance is summarized for several of the later tubes.

AD-620 397 Div. 8/2 ,15/1
CFSTI Prices: HC $4.00 MF $0.75
TEXAS TECHNOLOGICAL COLL LUBBOCK
TOPOLOGICAL METHODS APPLIED TO ACTIVE NETWORKS.
Doctoral thesis,
by Eldred Donald Merkl. 0 Aug 65, 113p. Contract AF33 608 1119
Unclassified report

Descriptors: (*Electrical networks, Topology), (*Topology, Electrical networks), Transistors, Electron tubes, Resistance (Electrical), Determinants, Polynomials, Matrix algebra

An extension is presented of the topological methods of Feussner-Seacat and Percival used in analyzing passive electrical networks. Active networks containing one vacuum tube and one transistor are analyzed to obtain the necessary modification of both methods.

AD-620 398 Div. 8/2 ,15/1
CFSTI Prices: HC $3.00 MF $0.75
TEXAS TECHNOLOGICAL COLL LUBBOCK
A TOPOLOGICAL METHOD OF SYNTHESIS FOR A CLASS OF BIQUADRATIC INPUT IMPEDANCE FUNCTIONS.
Doctoral thesis,
by Reagan H. Beene Jr., 0 Aug 65, 64p. Contract AF33 608 1119
Unclassified report

Descriptors: (*Electrical networks, Synthesis), (*Topology, Electrical networks), (*Electrical impedance, Functions), Resistance (Electrical), Capacitance, Determinants, Sensitivity, Polynomials

Topology is applied to one of the areas of the synthesis of biquadratic impedances, namely impedances realizable with an arbitrary number of resistors and not more than two storage elements. The method of residual networks forms the basis of the method of synthesis. The networks are assumed to be linear, passive, lumped, and bi-lateral.

AD-620 416 Div. 8/2 ,2/4 ,19/3
OHIO STATE UNIV COLUMBUS
A STUDY OF MEASUREMENTS MADE WITH THE MODEL MRA-1 TELLUROMETER.
Master's thesis,
by William Hunt Burger. 01965, 66p. Contract AF33 608 1095
Unclassified report

Available only for reference use at DDC field services. Copy is not available for public sale.

Descriptors: (*Distance-measuring equipment, Electronic equipment), (*Measuring devices (Electrical + Electronic), Distance-measuring equipment), (*Surveying, Electronic equipment), Errors, Meteorological parameters, Correlation techniques, Atmospheric refraction, Microwaves, Phase measurement, Wave transmission, Time, Calibration, Geodesics

The purpose of this study was to investigate the accuracy of the Model MRA-1 Tellurometer. The main concern of the investigation was the correlation between absolute humidity and true observed

error. Since one of the critical phases in the reduction of Tellurometer distances involves the determination of the index of refraction, which depends on the observed meteorological parameters, an analysis of the effects of differential changes in the meteorological parameters involved in these formulas was made.

AD-620 417 Div. 8/2 ,2/4 ,19/3
CFSTI Prices: HC $2.00 MF $0.50
OHIO STATE UNIV COLUMBUS
AN EXAMINATION OF THE ERRORS IN SHORT LINE MEASUREMENT WITH THE MRA2 TELLUROMETER.
Master's thesis,
by Robert Edward Furry. 01965. 42p. Contract AF33 608 1095

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale. See also AD-620 416.

Descriptors: (*Distance-measuring equipment, Electronic equipment), (*Measuring devices (Electrical ; electronic), Distance-measuring equipment), (*Surveying, Electronic equipment), Errors, Meteorological parameters, Correlation techniques, Atmospheric refraction, Microwaves, Phase measurement, Wave transmission, Time, Calibration, Geodesics

AD-620 441 Div. 8/2
CFSTI Prices: HC $3.00 MF $0.75
OKLAHOMA UNIV NORMAN
THE DESIGN AND ANALYSIS OF AN ACTIVE, TUNABLE BANDPASS FILTER.
Master's thesis,
by Mike W. Gural. 01965, 73p. Contract AF33 608 1096

Unclassified report

Descriptors: (*Band-pass filters, Synthesis), Tuning devices, Extremely low frequency, Very low frequencies, Attenuation, Networks, Electrical engineering

The purpose of this paper is the analysis and design of a bandpass filter with an attenuation of at least 30db per octave in the rejection band and a bandwidth of onethird octave. This filter is to be tunable over the range of frequencies from 5 cps to 20 kcs.

AD-620 448 Div. 8/2
CFSTI Prices: HC $3.00 MF $0.75
NEW HAMPSHIRE UNIV DURHAM
SYNTHESIS OF DRIVING-POINT IMPEDANCES BY RC GYRATOR NETWORKS.
Master's thesis,
by James Carmen Jalbert. 0 Feb 65. 82p. Contract AF33 608 1088

Unclassified report

Descriptors: (*Electrical impedance, Synthesis), (*Electrical networks, Electrical impedance), Resistance (Electrical), Capitance, Inductance, Admittance, Triodes, Functions

The techniques of cascade synthesis of driving-point impedances are extended to the RL case by means of RCideal-gyrator networks and Cascade synthesis procedures are devised for the realization of RLC and RL drivingpoint impedances by means of RC-non-ideal gyrator networks. The basic properties of ideal and non-ideal gyrators are discussed. The major contributions in the field of cascade synthesis by ideal gyrators are reviewed. A procedure for the realization of any RL driving-point impedance by means of a single ideal gyrator in cascade with an RC network is developed. Cascade synthesis procedures are developed for realizing driving-point impedances by RC-non-ideal gyrator networks. A method of removing resistance from a function by applying the positive real criteria to the function is presented.

AD-620 467 See Fld. 17/2

AD-620 547 Div. 8/4
CFSTI Prices: HC $3.00 MF $0.75
GENERAL ELECTRIC CO SYRACUSE N Y TUBE DEPT
RESEARCH AND DEVELOPMENT OF MINIATURE, ENVIRONMENTALIZED, ELECTROSTATIC IMAGE ORTHICON.
Rept. no. 14 (Final), for 1 Sep 63-31 Jan 65,
by B. E. Day. 31 Jan 65. 66p. Contract DA36 039AMC02264E Proj. DA 1P622001A055 03

Unclassified report

Continuation of Contract DA36 039SC88964.

Descriptors: (*Image orthicons, Electron optics), (*Electrostatics, Image orthicons), (*Miniature electron tubes, Image orthicons), Electron beams, Focusing, Deflection, Electrostatic fields, Camera tubes, Resolution

The development of an electrostatic image orthicon, which has been miniaturized and ruggedized, is described. Resolution sensitivity curves as well as other performance characteristics are included, and center-to-edge resolution improvements in the electrostatic imagesection are discussed. (Author)

AD-620 572 See Fld. 18/8

AD-620 573 See Fld. 18/8

AD-620 576 Div. 8/2
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
FIXED AND VARIABLE FREQUENCY OSCILLATORS WITH IMPROVED FREQUENCY STABILITY,
by F. M. Gager, and J. M. Headrick. 0 May 47. 11p. Rept. no. NRL-3082

Unclassified report

Previously announced Apr 60 as PB-129 148, LC mi$1.80, ph$1.80.

Descriptors: (*Radiofrequency oscillators, Stability), Crystal oscillators, Frequency, Circuits, Reliability (Electronics)

The report discloses new vacuum-tube oscillator systems exhibiting a frequency stability determined substantially by the characteristics of the intended frequencycontrolling element. These circuits are capable of satisfactory operation at low and high frequencies and utilize a minimum of circuit components. Fixed and variable versions are given, and application to measuring equipments, primary equipments and frequency standards is indicated. A variation of one circuit offers an excellent means of determining effective resonant element series resistance. (Author)

AD-620 580 Div. 8/4
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
SPECTRAL EMISSIVITY AND ELECTRON EMISSION CONSTANTS OF THORIA CATHODES FORMED BY CATAPHORESIS,
by T. E. Hanley. 12 Aug 47. 17p. Rept. no. NRL-3157

Unclassified report

Previously announced Apr 60 as PB-129 171, LC mi$2.40, ph$3.30.

Descriptors: (*Electron tube parts, Materials), (*Cathodes (Electron tubes), Thorium compounds), (*Thorium compounds, Emissivity), Dioxides, Electrophoresis, Electrodeposition, Thermal properties, Particle size, Electrons, Diodes (Electron tubes), Thermionic emission, Electrical conductance

A method is described for forming thoria cathodes by electrochemical means, namely cataphoresis. In this method a thin layer of thoria is deposited over an underlying metal. A temperature scale is set up and the spectral emissivity is determined for this type of coating. Also, the electron emission constants were measured over a range of temperatures and it was found that these constants are different for d-c and pulsed emission. In addition, data are presented which set an upper limit to the resistivity of thoria as a function of temperature. (Author)

AD-620 587 Div. 8/2 ,1/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
TIME DELAY RELAYS FOR AIRCRAFT APPLICATIONS,
by W. M. Tucker. 9 Jun 48. 17p. Rept. no. NRL-3292

Unclassified report

Previously announced 1 Oct 53 as PB-109 751, LC mi$1.75, ph$2.50.

Descriptors: (*Time-delay relays, Aircraft), (*Aircraft equipment, Time-delay relays), Pneumatic devices, Timing circuits, Solenoids

An investigation was conducted to determine methods of obtaining time delay in aircraft relays in which the delay is not to be adversely affected by current, voltage, atmospheric pressure, vibrations, or ambient temperature changes. Various means of obtaining time delays were investigated, both theoretically and experimentally. Two types of relays found to have good possibilities were a thermal and an electromechanical type. The thermal type containing two electrically heated bimetal strips gives a fair degree of accuracy but requires at least 45 seconds recycling time. The electromechanical type contains a timing motor whose speed is controlled by a vibrating reed. It has good accuracy and can be recycled almost instantly. Further development of both types is recommended. A constant current device should be incorporated into the thermal type so as to make it reasonable independent of applied voltage. Size, weight and susceptibility to vibration should be improved upon in the electromechanical type. (Author)

AD-620 588 Div. 8/4 ,8/3
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
SIMULATION METHODS APPLIED TO SINGLETUBE HARMONIC GENERATOR DESIGN,
by H. H. Grimm. 7 Jul 48. 16p. Rept. no. NRL-3309

Unclassified report

Previously announced 10 Jul 53 as PB-111 159, LC mi$2.00, ph$2.75.

Descriptors: (*Waveform generators, Harmonic oscillators), (*Harmonic oscillators, Frequency multipliers), (*Frequency multipliers, Simulation), Pentodes, Circuits, Audiofrequency, Distortion, Oscillographs

A method has been found for improving the gain obtained in frequency multipliers through a study of the process of harmonic generation in single-tube circuits. Since distorted waveforms having a fundamental above 500 kc, and prominent harmonic components up to the 10th, could not be observed with fidelity, simulation methods were used. Circuits operating in the audio range were used to study distorted waveforms having the desired shapes. In this way waveforms were produced in the audio-frequency circuits having shapes exactly like those to be expected in frequency multipliers designed to operate at much higher frequencies. All components were properly scaled in electrical size. The conditions to be imposed upon the circuits in order to secure adequate simulation are derived. Experimental data is given for a specific simulation problem. Oscillograms showing the distorted waveforms under various conditions are presented. The emphasis in this

work has been directed at securing unity voltage gain utilizing a single pentode tube to obtain a frequency multiplication of 10. (Author)

AD-620 599 Div. 8/2 ,26/1
CFSTI Prices: HC $4.00 MF $0.75
LINDE DIV UNION CARBIDE CORP CLEVELAND OHIO
PRODUCTION ENGINEERING MEASURE FOR IMPROVED RELIABILITY OF SOLID TANTALUM ELECTROLYTIC CAPACITORS.
Final rept. for 1 Jul 63-30 Jun 65,
by H. W. Holland. 30 Jun 65, 105p. Contract DA36 039AMC03624E
Unclassified report

See also AD-615 958.

Descriptors: (*Tantalum capacitors, Manufacturing methods), Reliability (Electronics), Electrolytic capacitors, Life expectancy, Quality control, Failure (Mechanics), Production, Tantalum, Powder metals, Specifications, Processing

Approximately 1,400 22 microforads, 50 volt capacitors meeting all quality requirements of MIL-C-39003 (Group A acceptance inspection) and also exhibiting a failure rate less than 0.001% per thousand hours were made in the Production Run. Ability to achieve the failure rate goal while using tantalum powder from several sources was demonstrated. All such capacitors showed acceptable parametric values, although some differences among sources were evident. Meticulous care in performance of every process step was found to be an important ingredient in uniform production of high-reliability capacitors. Small errors might have only a marginal effect on performance when failure rate is not a prime consideration, but the same errors can lead to catastrophes when low failure rates are needed. The value of accelerated life testing was demonstrated in that each batch of capacitors, even though relatively small in size, could be tested for failure rate within two weeks' time and thus provide rapid feedback for proper adjustment of process conditions. (Author)

AD-620 659 Div. 8/2
CFSTI Prices: HC $1.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
ON THE ACCURACY OF THE WKBJ METHOD APPLIED TO PARAMETRICALLY EXCITED SYSTEMS,
by John Staudhammer. 13 Aug 65, 19p. Rept. no. SP-2172/000/00
Unclassified report

Prepared in cooperation with Arizona State Univ., Tempe. See also AD-620 658.

Descriptors: (*Numerical analysis, Effectiveness), (*Differential equations, Parametric amplifiers), (*Parametric amplifiers, Differential equations), Resonance, Circuits, Stability

The Wentzel-Kramers-Brillouin-Jeffreys approximation is applied to the Mathieu equation and to a modified form of that equation. Results are then used in the Floquet criterion. It is shown that to a first approximation the resonance frequencies may be obtained. Refinement of the results shows that a conservative estimate of the unstable regions may be made with relatively little effort. The method appears to be applicable to a wide class of periodically excited systems. (Author)

AD-620 686 See Fld. 17/2

AD-620 700 Div. 8/2
CFSTI Prices: HC $1.00 MF $0.50
IIT RESEARCH INST CHICAGO ILL
EVALUATION OF SILICON METALLIC RECTIFIERS.
Interim engineering rept. no. 11, 1 Jan-31 Mar 61. 1 Apr 61, 23p. Rept. no. E-107
Contract NObs72444 Proj. S F013 12 09
Unclassified report

See also AD-276 987.

Descriptors: (*Silicon, Crystal rectifiers), (*Crystal rectifiers, Silicon), Diodes (Semiconductor), Life expectancy, Temperature

Three groups of rectifiers are being subjected to life test at different ambient temperatures to determine three points on a curve of life versus ambient temperature. An accumulated test time of over 8000 hours has been represented by data gathered on the 200 C environmental group. To date, a total of 35 failures have occurred, and 10 diodes have survived the life test on this group. The 185 C and 170 C environmental groups have been subjected to over 5000 hours of experiment. At the end of 4392 hours, 30 failures had occurred for the 185 C test group and seven failures for the 170 C test group. These total failure quantities did not increase over those observed by the end of the previous quarter. (Author)

AD-620 714 See Fld. 20/8

AD-620 729 Div. 8/4
CFSTI Prices: HC $1.00 MF $0.50
DUMONT ELECTRON TUBES CLIFTON NJ
12" DIAMETER CATHODE-RAY TUBE WITH FIBER OPTIC FACEPLATE.
Quarterly interim development rept. no. 3, 1 Jan-31 Mar 65,
by Madison Cawein. 28 Jul 65, 9p. Contract NObsr91206 Proj. SF0070501 Task 6030
Unclassified report

Descriptors: (*Cathode ray tubes, Fiber optics), (*Fiber optics, Cathode ray tubes), Manufacturing methods, Specifications, Electron tubes, Display systems

The purpose of this program is to develop, fabricate and supply two fiber optic faceplate cathode ray tubes, having the electrical characteristics of the 12BCP19. These tubes shall be suitable for testing in the AN/SYA-4 (V) Console Data Input Display. Du Mont Electron Tubes Division utilized the third quarterly period to fabricate glass cones for dummy tubes and process and test the first dummy tube. Actually, three dummy tubes were fabricated by the vendor. Two of these were rejected at Du Mont. The third dummy was processed and tested. This third dummy passed all electrical MIL-E-1 specs; and, on the basis of its successful performance the design of the final tube was completed. Four glass cones were delivered to the vendor in this period. (Author)

AD-620 730 Div. 8/4
CFSTI Prices: HC $1.00 MF $0.50
DUMONT ELECTRON TUBES CLIFTON NJ
12" DIAMETER CATHODE-RAY TUBE WITH FIBER OPTIC FACEPLATE.
Quarterly interim development rept. no. 4, 1 Apr-30 Jun 65,
by Madison Cawein. 6 Aug 65, 11p. Contract Nobsr91206 Proj. SF0070501 Task 6030
Unclassified report

See also AD-620 729.

Descriptors: (*Cathode ray tubes, Fiber optics), (*Fiber optics, Cathode ray tubes), Manufacturing methods, Military requirements, Specifications, Electron tubes, Display systems

Du Mont Electron Tubes Division utilized the fourth quarterly period to process and fabricate a second dummy F.O. tube and start the fabrication of a final, real F.O. tube of type KC2474P19. The second dummy was necessary to test an exhaust schedule cam which had to be fabricated in this quarter for bakeout of the final tubes. A potting fixture was designed and fabricated for potting the dummy and final tubes with RTV around the gold-foil frit seal. The cone and final assembly drawings were revised and up-dated at the start of this period. (Author)

AD-620 735 Div. 8/2 ,15/1
CFSTI Prices: HC $3.00 MF $0.75
CASE INST OF TECH CLEVELAND OHIO
TRANSFER MATRIX SYNTHESIS USING ACTIVE RC NETWORKS.
Scientific rept.,
by D. Hazony, and R. D. Joseph. 1 May 65, 72p. Rept. no. SR-9
Contract AF19 628 1699 Proj. 5635 Task 563501
AFCRL , 65-405
Unclassified report

Descriptors: (*Electrical networks, Synthesis), (*Matrix algebra, Synthesis), Voltage, Resistance (Electrical), Capacitance, Functions, Voltage amplifiers, Gain, Ground (Electrical)

Necessary conditions are established for the voltage transfer matrix of a transformerless grounded network composed of ideal resistors, inductors, capacitors (RLC), and grounded unity gain amplifiers. These conditions are also shown to be sufficient for realization as the voltage transfer matrix of a transformerless grounded network containing RC and not more than one grounded unity gain amplifier per matrix row. Similar necessary, and sufficient, conditions are presented for transformerless grounded input, nongrounded output networks composed of these same passive and active elements. The grounded input, nongrounded output case requires not more than two grounded unity gain amplifiers per matrix row for its synthesis. In the two-port nongrounded case a special procedure makes it possible to realize the transfer function by the proper connection of two identical threeterminal networks. (Author)

AD-620 748 See Fld. 6/16

AD-620 760 Div. 8/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
DC VOLTAGE STABILIZER,
by Yu. N. Pryadilov. 9 Aug 65, 6p. Rept. no. FTD-TT-65-962
TT , 65-63817
Unclassified report

Unedited rough draft trans. of Patent (USSR) 165 782, appl. no. 824930/26-9, 23 Nov 64.

Descriptors: (*Voltage regulators, Direct current), Wiring diagrams, Semiconductor devices, Magnetic amplifiers, Diodes (Electron tubes), Electric bridges, Patents, USSR

A dc voltage stabilizer with a load current of several amperes containing a magnetic amplifier and a bridge with a vacuum diode is described. In order to increase the accuracy of voltage stabilization during temperature variations in the surrounding medium a copper manganin thermodependent resistor is included in the diode heater circuit. The resistor is mounted with manganin wire. AA thermostable resistor which compensates for temperature variations of the output voltage regulator potentiometer is included in the output bridge circuit. (Author)

AD-620 783 Div. 8/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
ELECTRONIC OUTPUT RELAY,
by A. V. Kulikovskii. 12 Aug 65, 6p. Rept. no. FTD-TT-65-636
TT , 65-63835
Unclassified report

Unedited rough draft trans. of Russian Patent 163 678, pub. 4 Apr 63, appl. no. 828931/26-24.

Descriptors: (*Electronic relays, Patents), Electronic switches, Semiconductor devices,

Electric bridges, Transistors, Triodes, Generators, High frequency, Wiring diagrams, USSR

An electronic output relay which contains semiconductor switches and a bridge circuit on the output is described. Two high-frequency generators with double negative feedback are used to assure stability and two semiconductor triodes (transistors) are used to control the working of these generators. Transistors are also used to control inputs of semiconductor switches connected with the output windings of the generators.

AD-620 786 Div. 8/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
PHASE MEASURING DEVICE,
by V. F. Gorneev, and A. M. Savinov. 25 Aug 65, 6p. Rept. no. FTD-TT-65-480
TT , 65-63838
Unclassified report

Unedited rough draft trans. of Russian Patent 162 246, pub. 11 Apr 63, appl. no. 830273/26-10.

Descriptors: (*Phase meters, Patents), Relays, Polarization, Trigger circuits, Electric bridges, Transformers, USSR

A phase measuring device, intended for the determination of magnitude of phase angle between two AC signals, is described. The device consists of two transformers, two triggers and a matching amplifier with rectifying bridge. A polarized relay is used for the purpose of obtaining triangular characteristic of amplifier output current from the angle of phase displacement between signals and to assure change in alternation of pulses at amplifier input. The contacts of the relay are connected into one of the channels of phase measuring block. (Author)

AD-620 787 Div. 8/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
ELECTRONIC COMMUTATOR,
by V. I. Turchenkov. 12 Aug 65, 8p. Rept. no. FTD-TT-65-633
TT , 65-63839
Unclassified report

Unedited rough draft trans. of Russian Patent 161 574, pub. 24 May 62, appl. no. 779890/26-24.

Descriptors: (*Commutators, Alternating current), Wiring diagrams, Electronic equipment, Trigger circuits, Transformers, Diodes, Patents, USSR

An alternating current electronic commutator is described. The commutator consists of a binary trigger counter, transformers, and diodes. The commutator is distinguished from the known ones by the fact that for the commutation of alternating current from the trigger in it the input windings of two transformers of the following discharge are connected up to the output winding of the transformer of the preceding discharge through diodes connected into both arms of each of the windings of the transformers of the following discharge. To the winding of the first of the transformers of the following discharge the diodes are connected by their anodes, and to the winding of the second by the cathodes.

AD-620 800 Div. 8/2 ,5/2
CFSTI Prices: HC $2.00 MF $0.50
MOTOROLA INC PHOENIX ARIZ SEMICONDUCTOR PRODUCTS DIV
SMALL SIGNAL FUNCTIONAL CIRCUITS.
Quarterly progress rept. no. 3, 1 Jan-31 Mar 65, by James Feit, and Robert McGinnis. 31 Mar 65, 30p. Contract DA28 043AMC00150E Proj. DA-1P6 22001A 056 Task 1P6 22001A05602
Unclassified report

See also AD-615 125.

Descriptors: (*Integrated circuits, Radio receivers), (*Radio receivers, Integrated circuits), Portable, Silicon, Radiofrequency amplifiers, Intermediate frequency amplifiers, Mixers (Electronic), Oscillators, Frequency modulation, Microminiaturization (Electronics), Circuits

The report outlines the third quarter of effort covering the development of small signal functional circuits. During this quarter, the front-end integrated circuits (r-f amplifier, first oscillator, and second oscillator/ mixer circuits) underwent processing. These circuits have completed diffusion and metalization processing and are presently being assembled. Evaluation of the breadboard developmental model receivers continued during this time period. Special emphasis was given to the selection of the 455 i-f filter. A decision was made to modify the receiver to be more compatible with the system requirements of the AN/PRR-9 receiver and the AN/PRT-4 transmitter. In line with this change, the power supply was converted from 6 volts to 3 volts, and a new 3 volt audio output stage was designed to deliver 7 mw of power to an audio transducer. The squelch, discriminator, and i-f selectivity were modified to operate over a = 15 kc bandwidth. The receiver package and printed circuit board were redesigned to facilitate packaging of the receiver in the AN/PRR-9 housing. (Author)

9/2. COMPUTERS

AD-620 129 See Fld. 9/3

AD-620 186 Div. 30/2 ,15/1
CFSTI Prices: HC $5.00 MF $1.00
COMPUTER USAGE CO INC PALO ALTO CALIF
STRATEGIES OF FUNCTION DECOMPOSITION FOR ARTIFICIAL INTELLIGENCE, VOLUME II.
Final scientific rept. for Sep 64-Jun 65, by David G. Willis. 1 Jul 65, 154p. Rept. no. RN-12-25
Contract AF49 638 1315 ,AF49 638 1454 Proj. 9769 Task 976906
AFOSR , 65-1612
Unclassified report

Descriptors: (*Artificial intelligence, Functional analysis), (*Functional analysis, Artificial intelligence), Pattern recognition, Special functions (Mathematical)

Preliminary results are reported in 13 research notes on strategies of function decomposition solely from observations of inputs (variable configurations) and outputs (function values). The classes of functions to which the results apply include discrete, finite, deterministic functions as well as arbitrary close discrete approximations to continuous functions of continuous variables. Nondeterministic (i.e., probabilistic) and sequential (i.e., finite automata) functions are not included. The research notes consider (a) decomposition costs and the equivalence of all measures of cost or complexity; the detection of economical decompositions; and (c) generalizing properties of economical decompositions. Efficient procedures are suggested for detecting economical non-composite decompositions of any given partial or total discrete function solely from input and output observations. Composite decompositions become tractable when enough is known or properly conjectured about their sub-functions. (Author)

AD-620 236 Div. 30/2 ,15/1
CFSTI Prices: HC $4.00 MF $1.00
LITTON SYSTEMS INC WALTHAM MASS INFORMATION SCIENCES LAB
MATHEMATICAL STUDY FOR PROPERTY TRANSFORMATIONS.
Final technical rept. for Mar 64-Mar 65, by G. Sebestyen. 0 Jul 65, 141p. Rept. no. DS-65-002
Contract AF30 602 3355 Proj. 5581 Task 558104
RADC , TR-65-167
Unclassified report

Descriptors: (*Pattern recognition, Decision theory), (*Transformations (Mathematical), Decision theory), (*Decision making, Pattern recognition), Set theory, Probability, Communication theory, Programming (Computers)

Inputs to pattern recognition systems are represented by a set of properties. The problem of transforming property sets by mathematical transformations to obtain a new set of properties to facilitate decision making with systems of lesser complexity is considered. Different mathematical formulations of the measurement selection problem are discussed and criteria for deriving property transformations are developed from information theoretic considerations. Transformations for minimizing the entropy, for maximizing the divergence, and for minimizing the probability of error (under certain constraints) are derived. While the distributions of stimulus classes (after transformation) are indeed made simpler by the transformations derived in this report, the complexity of the transformations casts doubt on the utility of using mathematical transformations to simplify the property space. The tentative conclusion is reached that, for the time being, it is more useful to analyze the property space for its ability to discriminate between stimulus classes. A set of procedural steps and computations are developed for implementing the analysis of chosen property spaces. (Author)

AD-620 237 Div. 30/2 ,15/1
CFSTI Prices: HC $4.00 MF $0.75
PENNSYLVANIA STATE UNIV UNIVERSITY PARK ORDNANCE RESEARCH LAB
SYNTHESIS OF INPUT EQUATIONS FOR ERRORTOLERANT COUNTERS.
Technical memo.,
by E. C. Longenecker. 16 Aug 65, 124p. Rept. no. TM-621.3481-02
Contract NOw65 0123d
Unclassified report

Thesis.

Descriptors: (*Computer logic, Errors), (*Equations, Computer logic), Relaxation oscillators, Malfunctions, Redundant components, Reliability (Electronics), Optimization, Sequence switches

A computer-oriented procedure was developed to derive the sets of dual-input equations for error-tolerant counters. The counters are composed of J-K Flip-flops interconnected by And-Or logic with an external sequencing pulse. The synthesis procedure involves the selection of terms which satisfy a concise set of distance and intersection properties. The equations are minimized either for the fewest number of Ands and diodes, or for the fewest number of undetectable malfunctions, where an undetectable malfunction is an undetectable control level diode on an And. Approximately 700 counters were synthesized to derive either the configuration using the least amount of equipment or the configuration having the least number of undetectable malfunctions. The counters used either minimum distance three or minimum distance four state assignments to obtain the error-tolerant property.

AD-620 248 Div. 30/2
CFSTI Prices: HC $3.00 MF $0.75
ILLINOIS UNIV URBANA COORDINATED SCIENCE LAB
SELF-DIAGNOSIS OF ELECTRONIC COMPUTERS. AN EXPERIMENTAL STUDY.
Doctoral thesis,
by Eric G. Manning. 0 Jul 65, 83p. Rept. no. R-259
Contract DA28 043AMC00073E Grant ,NSF-GK36 Proj. 20014501B31F
Unclassified report

Descriptors: (*Computers, Design), (*Malfunctions, Determination), Failure (Mechanics), Maintenance, Computer logic, Circuits

The problem considered is the development of design principles which will permit the design of self-diagnosing computers. A self-diagnosing computer is one for which there exists a self-diagnosis procedure, defined as an experiment having one of two outcomes: (a) All transistordiode logic is entirely failure-free; or (b) Card or module x has a failure of type y. Also, the procedure must be sufficiently fast to permit execution every few hours, using non-technical personnel. So little is known about the problems involved in making a computer self-diagnosing, that it is appropriate to first attack a more restrictive, experimental problem. Consequently, an attempt was made to derive a self-diagnosis procedure for the executionphase hardware (main control, arithmetic unit, and decoders) of an existing machine (the CSX-1). The principal experimental tool was the Sequential Analyzer system which allows digital simulation of the class of sequential machines generated under failure from a given machine. (Author)

AD-620 252 **See Fld. 6/12**

AD-620 279 **See Fld. 14/5**

AD-620 280 **See Fld. 20/8**

AD-620 292 **See Fld. 15/5**

AD-620 295 Div. 30/2 ,25/7
CFSTI Prices: HC $2.00 MF $0.50
NAVAL AMMUNITION DEPOT CRANE IND
COMPUTER PROGRAM FOR THE ANALYSIS OF VISIBLE SPECTROMETRIC DATA: CHROMATICITY,
by James Swinson. 26 Aug 65, 46p. Rept. no. RDTR-59

Unclassified report

Descriptors: (*Programming (Computers), Spectra (Visible + ultraviolet)), (*Spectra (Visible + ultraviolet), Data), Colors, Specturm analyzers, Monochromatic light, Tables, Illumination, Intensity, Punched cards

The report includes a detailed description of a computer program used with an IBM 1620 computer to reduce and analyze spectrometric data from the visible spectrum. Included is a point by point outline of the operations performed by the program and discussion of its uses, which are to calibrate the spectrometer from collected data and to determine and print out the system response of the spectrometer and relative energy distribution vs wavelength, relative luminous intensity (candlepower) and the x, y, and z chromaticity coordinates for an unknown. The necessary information for computer input and a suggested format for recording this data is outlined, along with instructions for key-punching the input data cards and instructions for the computer operator. The FORTRAN statements for the program are included. (Author)

AD-620 299 **See Fld. 9/1**

AD-620 408 **See Fld. 15/7**

AD-620 427 **See Fld. 13/13**

AD-620 496 Div. 30/2 ,28/1
SYSTEM RESEARCH LTD RICHMOND (ENGLAND)
A DISCUSSION OF ARTIFICIAL INTELLIGENCE AND SELF-ORGANIZATION,
by Gordon Pask. 01964, 62p. Contract AF61 052 640 Proj. 9769 AFOSR , 65-1168

Unclassified report

Pub. in Advances in Computers, New York v5 p110-225 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Artificial intelligence, Learning), (*Learning, Behavior), Computers, Automata, Brain, Electrical networks, Bionics, Language

The characteristics of a self-organizing system, a system with a behavior that becomes more ordered, is outlined. A special case is developed for self-organization as it appears in connection with automata or computing machines. Discussion is centered on learning and on mechanisms that give rise to learning behavior. It is contended that artificial intelligence is a special property of a self-organizing system capable of controlling its activities. Since artificial intelligence resembles man's own mentation, the workings of the human brain are relevant to the design of an intelligent machine. Various psychological and physiological models of human learning and concept acquisition are examined. Man-machine interaction is considered--man educates the machine and the machine extends man's capabilities. It is concluded that an artificial intelligence is more economically created by allowing it to evolve in the environment it will later inhabit providing that we ensure its survival by building into it a set of basic and necessary capabilities. (Author)

AD-620 524 **See Fld. 20/4**

AD-620 581 **See Fld. 19/5**

AD-620 602 **See Fld. 5/9**

AD-620 611 Div. 30/2
CFSTI Prices: HC $4.00 MF $1.00
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
THE JOVIAL MANUAL, PART 2. THE JOVIAL (J3) GRAMMAR AND LEXICON.
Technical memo.,
by Millard H. Perstein. 1 Sep 65, 142p. Rept. no. TM-555/002/03

Unclassified report

Descriptors: (*Programming languages, Handbooks), Programming (Computers), Language, Analysis

This is the reference manual for the J3 version of the JOVIAL language. J3 is the full language. This manual defines the full syntax and semantics without drawing fine distinctions between the two aspects. (Author)

AD-620 651 **See Fld. 12/1**

AD-620 656 Div. 30/2
CFSTI Prices: HC $1.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
ERROR ESTIMATES IN ANALOG COMPUTATIONS.
Professional paper,
by John Staudhammer. 16 Aug 65, 16p. Rept. no. SP-2173/000/00

Unclassified report

Descriptors: (*Analog computers, Errors), Circuits, Computer logic, Equations

A set of equations is derived for estimating the first-order errors in simple analog circuits. For the simple scale-changing inverter, these equations are shown to be decomposable into errors due to finite gain, nonzero input admittance, and output impedance. The contribution of each of these sources of inaccuracy may be easily combined to yield the final overall estimate of the error. For the integrator, no such easy simplification was found, but the general expression for the first approximator of the error is given in dimensionless form. (Author)

AD-620 657 **See Fld. 5/2**

AD-620 660 Div. 30/2
CFSTI Prices: HC $1.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
QUANTITATIVE ANALYSIS OF COMPUTER PROGRAMMING COST FACTORS: A PROGRESS REPORT,
by Leonard Farr, and Henry J. Zagorski. 26 Aug 65, 21p. Rept. no. SP-2036

Unclassified report

Prepared for presentation at the International Computation Centre, Symposium on Economics of EDP, Rome (Italy), 19-22 Oct 65.

Descriptors: (*Programming (Computers), Costs), (*Costs, Statistical analysis), Data processing systems, Management engineering, Time studies, Coding

Results of an exploratory analysis aimed at deriving quantitative cost-estimating relationships for computer programming are presented. The study included the initial formulation of cost factors and a first attempt at data collection and analysis for the purpose of evaluating the presumed factors. Preliminary equations for estimating costs in terms of man months were derived. These equations were evolved from a small sample of programs, were based on data from an experimental questionnaire, and are not considered reliable. While some of the equations are presented for illustration, their use is not recommended for actual planning. The study demonstrated the usefulness of multivariate regression analysis for deriving programming cost-estimating relationships. To improve the prediction equations, recommendations are made toward revising the data collection procedures, extending the survey to a larger and more representative sample, and broadening the investigation into other needed areas of program research. (Author)

AD-620 661 Div. 30/2
CFSTI Prices: HC $3.00 MF $0.75
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
THE MADAM SYSTEM.
Technical memo.,
by William O. Crossley. 5 Aug 65, 57p. Rept. no. TM-2198/001/00

Unclassified report

Descriptors: (*Data processing systems, Records), Programming (Computers), Computers, Programming languages, Control sequences, Reports, Punched cards, Magnetic tape, Data, Indexes

MADAM (Moderately Advanced DAta Management) is a file builder, a file manipulator, and report generator. It provides a means for taking initially unorganized lines of data (records) and organizing them in a describable and retrievable manner into units (files). It maintains these files, creates new ones, and prints the contents of these files in various formats. The MADAM System operates on a particular user's problem by means of a set of specification statements in a language very much like that of the user. MADAM itself is made up of computer programs which translate and interpret the specification statements and perform the required operations. The specifications are incorporated in a control card deck that is operated upon by the system in conjunction with data cards or magnetic tape files. MADAM is implemented on an IBM 1401 computer with 8,000 characters core storage and four tape units.

AD-620 663 **See Fld. 5/9**

AD-620 691 Div. 30/2 ,12/1
CFSTI Prices: HC $4.00 MF $1.00
LINCOLN LAB MASS INST OF TECH LEXINGTON
PROCEDURES AND COMPUTER PROGRAMS FOR REDUCTION OF BALLISTIC PLATES FROM TRAILBLAZER I AND II PROGRAMS.

Technical note,
by Florence A. Wilson. 10 Mar 65, 139p. Rept. no. TN-1965-8
Contract AF19 628 500 Proj. arpa order 600
ESD , TDR-65-56

Unclassified report

Descriptors: (*Programming (Computers), Optical analysis), (*Reentry vehicles, Trajectories), (*Photographic plates, Ballistics), Celestial mechanics, Astronomy, Atmosphere entry

The Optical Reduction Programs have been written to obtain the space trajectory of a re-entering body from measurements of position on two photographic plates taken of a re-entry event from two separate stations. The method of analysis follows closely that developed by Whipple and Jacchia. The Programs are a modification for the Lincoln Laboratory 7094 computer of a program originally written at the Harvard Observatory for reduction of meteor trails. The computation is divided into two programs: (1) The Plate Calibration Program calibrates the plate by using coordinates and plate measurements of known stars as reference points; and (2) The Optical Trajectory Program computes range, height, time, direction cosines, and distance along the trail from the measured points on the trail. This paper discusses these two programs in detail, including program listings, flow charts, and directions for running the programs. The mathematical background and the experimental method for obtaining the input data are also discussed. (Author)

AD-620 748 **See Fld. 6/16**

AD-620 758 **See Fld. 12/1**

AD-620 802 **See Fld. 12/1**

9/3. ELECTRONIC AND ELECTRICAL ENGINEERNG

AD-620 129 Div. 8/3 ,8/7 ,25/4 ,30/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
NEW METHOD OF IMAGE SCANNING,
by D. S. Lebedev, and D. G. Lebedev. 15 Jun 65, 8p. Rept. no. FTD-TT-65-212
TT , 65-63347

Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR. Vestnik, v34 n11 p44-6 1964. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Bionics, Electron optics), (*Electron optics, Communication theory), (*Communication theory, Electron optics), Images, Optical scanning, Television communication systems, Facsimile communication systems, Video signals, Optics, USSR

The methods of scanning, using the characteristics of vision for describing the image with the minimum number of figures, are investigated for use in communication theory.

AD-620 502 Div. 7/2 ,25/8
CFSTI Prices: HC $1.00 MF $0.50
ROME AIR DEVELOPMENT CENTER GRIFFISS AFB N Y
LOW TEMPERATURE RESISTANCE OF SELECTED RESISTORS.
Technical rept.,
by Mark W. Levi. 0 Aug 65, 20p. Rept. no. RADC-TR-65-294
Proj. 8503 Task 850301

Unclassified report

Descriptors: (*Cryogenics, Resistors), (*Resistors, Cryogenics), Low temperature research, Tests

Selected resistors were measured over the liquid helium and liquid nitrogen ranges of temperature. The best resistors were found to have only a 2 percent total variation of resistance. (Author)

AD-620 548 Div. 8/3
CFSTI Prices: HC $1.00 MF $0.50
TRINITY COLL DUBLIN (IRELAND) PHYSICAL LAB
STATISTICS OF SECONDARY ELECTRON EMISSION.
Quarterly technical status rept. no. 2, 1 Mar-31 May 65,
by C. F. G. Delaney. 18 Jun 65, 9p. Contract DA91 591EUC3558

Unclassified report

Descriptors: (*Secondary emission, Statistical analysis), (*Semiconductor devices, Secondary emission), Silicon, Electrons, Scattering, Electron multipliers

The problem of backscattering from silicon detectors is considered.

AD-620 551 **See Fld. 11/7**

AD-620 554 Div. 8/3 ,6/6
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
ELECTROSTATIC DEFLECTION SYSTEMS FOR PLAN POSITION INDICATORS-II.
Interim rept. no. 2,
by Clyde B. Dobbie. 11 Oct 48, 14p. Rept. no. NRL-3367

Unclassified report

Previously announced Apr 60 as PB-129 300, LC mi$2.40, ph$3.30.

Descriptors: (*Plan position indicators, Electron optics), (*Electrostatics, Plan position indicators), Deflection, Electrostatic fields, Cathode ray tubes, Sweep generators, Radar antennas, Synchronization (Electronics), Errors

This report discusses factors affecting the performance of an electrostatic Plan Position Indicator (PPI) and methods of compensating for various errors in presentation. It includes descriptions of various systems for obtaining PPI traces by purely electronic means. One system eliminates the selsyn follower mechanism at the indicator by obtaining the antenna-position information from a sine potentiometer or Autosyn resolver phase-amplitude detector in such form that it can directly actuate the sweep generator. (Author)

AD-620 567 Div. 8/3 ,5/2
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
DEVELOPMENT OF AN IMPROVED RADIOFREQUENCY-FILTER SYSTEM FOR MODEL RDZ/RDZ-1 RECEIVING EQUIPMENT,
by W. C. Whitmer, and E. L. Powell. 0 May 47, 22p. Rept. no. NRL-3127

Unclassified report

Previously announced Apr 60 as PB-130 101, LCmi$2.40, ph$3.30.

Descriptors: (*Radiofrequency filters, Radio receivers), (*Radio receivers, Radiofrequency filters), Low-pass filters, Ultrahigh frequency, Attenuation, Radio signals, Electromagnetic shielding, Performance (Engineering)

The report covers the development of a substitutive filter system for the RDZ/RDZ-1 receivers in which the major deficiencies have been improved to the extent permitted by existing space limitations and current availability of suitable components. As a result of the modifications described herein, the overall average protection against rf energy introduced through the remote-line connections to the Model RDZ/RDZ-1 receiver has been increased to 112 decibels; i.e., an overall improvement of 59 decibels has been attained. (Author)

AD-620 582 **See Fld. 11/7**

AD-620 583 **See Fld. 1/3**

AD-620 584 **See Fld. 14/2**

AD-620 588 **See Fld. 9/1**

AD-620 601 Div. 8/3
CFSTI Prices: HC $3.00 MF $0.75
CITY COLL RESEARCH FOUNDATION NEW YORK
ELECTROSTATIC FOCUSING OF HOLLOW SPIRALING ELECTRON BEAMS.
Quarterly rept. no. 2, 5 Apr-5 Jul 65,
by Morris Ettenberg. 5 Jul 65, 69p. Contract DA28 043AMC00466E Proj. DA 1P6 22001A055 04 70

Unclassified report

See also AD-618 218.

Descriptors: (*Electron beams, Focusing), (*Electrostatic fields, Electron beams), Space charges, Design, Performance (Engineering), Programming (Computers), Electron tube heaters, Partial differential equations, Electromagnetic lenses

Two experiments were performed during this quarter. The first experiment failed before significant operation was achieved. The cause of the failure was a broken filament. Enough experience was gained with this model to indicate the desirability of a change in design. The second, redesigned experimental model was operated and performance data were taken. The best transmission was about 20%. MAD programs were written for the solution of Laplace's Equation in cylindrical coordinates and for the calculation of electron trajectories in electrostatic fields neglecting space charge. Various injection conditions were calculated. (Author)

AD-620 641 Div. 8/3
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
BOUNDS ON TWO-ELEMENT-KIND IMPEDANCE FUNCTIONS,
by T. S. Huang. 8 Mar 65, 1p. Contract DA36 039AMC03200E Grant ,NSF GP2495

Unclassified report

Pub. in Electronic Letters np Apr 1965 (Copies available only to DDC users).

Descriptors: (*Electrical impedance, Functions), Electrical networks, Resistance (Electrical), Capacitance, Inductance, Complex variables

Four types of two-element-kind networks are considered: R, =C; R, =L; =R,C; and =R,L networks. Regions in the Zplane are found within which the impedance function Z (j omega) must lie. (Author)

AD-620 650 **See Fld. 10**

AD-620 653 Div. 8/3 ,32/3
CFSTI Prices: HC $3.00 MF $0.75
AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C
GLOSSARY OF CHICOM TELECOMMUNICATIONS TERMS.
28 Jul 65, 91p. Rept. no. ATD-P-65-59
TT , 65-63777

Unclassified report

Rept. on Surveys of Chinese Communist Scientific and Technical Literature. Available copy will not

permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Dictionaries, Electronics), (*China, Electronics), (*Communication systems, Vocabulary), (*Electronics, Vocabulary), Electrical engineering, Communication equipment, Language

AD-620 658 Div. 8/3
CFSTI Prices: HC $1.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
ON THE APPROXIMATE SOLUTION OF PARAMETRICALLY EXCITED SYSTEMS,
by John Staudhammer. 19 Aug 65, 15p. Rept. no. SP-2186/000/00

Unclassified report

Prepared in cooperation with Arizona State Univ., Tempe.

Descriptors: (*Electrical engineering, Numerical methods + procedures), (*Numerical methods + procedures, Electrical engineering), (*Circuits, Numerical analysis), Linear systems, Differential equations, Electrical properties, Parametric amplifiers

Amplication of the Wentzel-Kramers-Brillouin-Jeffreys method to a prototype varactor circuit gives the spectrum of the steady state solution. In a linear circuit whose parameters are varied with two independent signals, the resultant spectrum is shown to be the product of the spectra of two signals, either of which is obtainable from the circuit by neglecting the other signal. Hence this circuit is a linear modulator circuit. Numerical examples are used for illustration. (Author)

AD-620 690 Div. 8/3
CALIFORNIA UNIV BERKELEY ELECTRONICS RESEARCH LAB
FOCUSING OF AN ELECTRON STREAM WITH RADIOFREQUENCY FIELDS,
by C. K. Birdsall, and G. W. Rayfield. 6 May 64, 24p. Contract AF AFOSR117 63 Proj. 9767 Task 976702
AFOSR , 65-1109

Unclassified report

Pub. in Journal of Electronics and Control v17 n6 p601-22 Dec 1964 (Copies available only to DDC users).

Descriptors: (*Electron beams, Focusing), (*Electromagnetic lenses, Radiofrequency), Electromagnetic waves, Space charges, Helixes, Velocity, Mathematical analysis

A cylindrical stream of electrons is focused solely by the fields of a slow electromagnetic wave. An analysis is obtained by transforming to the wave frame in which the equations of motion of electrostatic periodic focusing are valid. A second analysis is made by transforming to the electron frame and approximating the fields in order to compare fast-wave and slow-wave focusing. Several experiments are presented using a helix as the slow waveguide, and results are found to be in rough agreement with theory. (Author)

AD-620 727 Div. 8/3 ,8/6
CFSTI Prices: HC $2.00 MF $0.50
LINCOLN LAB MASS INST OF TECH LEXINGTON
MILLIMETER WAVE RESEARCH: PAST, PRESENT, AND FUTURE.
Technical rept.,
by J. W. Meyer. 17 May 65, 27p. Rept. no. TR-389
Contract AF19 628 500
ESD , TDR-65-72

Unclassified report

Descriptors: (*Millimeter waves, Scientific research), Bibliographies, Reviews, Communication systems, Radar equipment, Radio astronomy, Solid state physics, Electromagnetic waves, Propagation, Spectrum analyzers

This report is the edited transcript of a seminar given at Lincoln Laboratory on 2 March 1965. The cyclicity of interest in millimeter wave research is traced from the time of Hertz, when investigations of this part of the electromagnetic spectrum began. The waxing and waning of millimeter wave research are traced as exciting new fields are discovered which diverted the interest of physicists. Each re-emergence of millimeter wave research has been more robust, often because the results of the diversions were important to improved techniques. Early millimeter wave apparatus is described. The narrative of the development of a millimeter wave radar for the detection of the moon relates the opening of this spectral region to radar astronomy. Other applications are mentioned, along with future possibilities. A chronology, a list of large millimeter wave antennas, and a bibliography of review papers are included. (Author)

AD-620 761 **See Fld. 17/9**

9/4. INFORMATION THEORY

AD-620 129 **See Fld. 9/3**

AD-620 286 **See Fld. 5/10**

AD-620 315 **See Fld. 5/10**

AD-620 612 Div. 8/7
AIR FORCE CAMBRIDGE RESEARCH LABS BEDFORD MASS
APPROXIMATING THE PERFORMANCE OF A BINARY GROUP CODE.
Physical and mathematical sciences research papers,
by Charles F. Hobbs. 30 Dec 63, 12p. Rept. no. AFCRL-65-543 ,PMSRP-119
Proj. 5628 Task 562801

Unclassified report

Pub. in the IEEE Transactions on Information Theory p142-4 Jan 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Decoding, Probability), (*Coding, Effectiveness), Communication theory, Errors, Numerical analysis

This correspondence gives a method for approximating the decoded block error probability of a binary group code when the distribution of the weights of the code words is known, but the distribution of the weights of the correctable error patterns cannot be readily determined. If the distribution of weights of code words is not known, the method is still useful since Monte Carlo techniques can be used to approximate the distribution with the help of a digital computer. (Author)

AD-620 703 **See Fld. 5/10**

AD-620 706 Div. 8/7
LITTON SYSTEMS INC WALTHAM MASS
ON THE ENVELOPES OF ZONAL FILTER OUTPUTS OF MEMORYLESS DISTORTIONS OF NARROW-BAND PROCESSES.
Revised ed.,
by Albert H. Nuttall. 17 Oct 64, 1p. Contract Nonr332000

Unclassified report

Pub. in IEEE Transactions on Information Theory vIT-11 n2 p295-6 Apr 1965 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript dated 31 Jul 64.

Descriptors: (*Filters (Electromagnetic wave), Narrowband), (*Narrowband, Harmonic analysis), Integrals, Series, Distortion, Communication theory

A method is pointed out, involving real finite integrals and the nonlinear device under consideration, for expressing the envelope of the output of a zonal filter centered on the nth harmonic of a memoryless-distorted narrow-band process.

AD-620 785 Div. 8/7
CFSTI Prices: HC $2.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
ACADEMY OF SCIENCES OF THE USSR. INSTITUTE OF INFORMATION TRANSMISSION. PROBLEMS OF INFORMATION TRANSMISSION (SELECTED ARTICLES),
by O. V. Popov, V. G. Solomonov, and L. V. Zakharova. 10 Aug 65, 32p. Rept. no. FTD-TT-65-980
TT , 65-63837

Unclassified report

Unedited rough draft trans. of Problemy Peredachi Informatsii (USSR) n15 p61-70 and 71-4 1963. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Data transmission systems, Errors), (*Communication theory, Errors), Corrections, Coding, Functions, Electronic scanners, USSR

Contents: One method of correcting a bundle of errors, by O. V. Popov; and Recognition of continuous functions, by V. G. Solomonov and L. V. Zakharova.

9/5. SUBSYSTEMS

AD-620 114 **See Fld. 10**

AD-620 115 Div. 7/5 ,30/4
CFSTI Prices: HC $10.00 MF $3.00
BURNS AND ROE INC NEW YORK
DEVELOPING AND TESTING THE ADVANCED POWER CONVERSION EXPERIMENTAL FACILITY. VOLUME I.
Final technical rept., vol. 1, 1 May 63-30 Jun 65.
0 Aug 65, 700p. Contract DA44 009AMC179X

Unclassified report

Descriptors: (*Power plants (Establishments), Brayton cycle), (*Generators, Test facilities), (*Test facilities, Power plants (Establishments)), Gas turbines, Design, Testing, Operation, Maintenance, Performance (Engineering), Training, Management planning

The report describes the experimental testing and the results achieved, the operations, development and maintenance work accomplished, the designs prepared and implemented, and the test planning studies made for the Advanced Power Conversion Experimental Facility at Fort Belvoir, Virginia, from 1 May 1963 to 30 June 1965. The system and component performance investigations and evaluations that were completed are detailed. The training and education program for operating personnel and the administrative procedures and instructions developed and recommendations as to the programs and tasks to be pursued in the immediate future for continued progress along the planned lines of development of the facility are outlined. (Author)

AD-620 116 Div. 7/5 ,30/4
CFSTI Prices: HC $2.00 MF $0.75
BURNS AND ROE INC NEW YORK
DEVELOPING AND TESTING THE ADVANCED POWER CONVERSION EXPERIMENTAL FACILITY. VOLUME I, SUPPLEMENT.
Final technical rept., vol. 1, suppl. 1 May 63-30 Jun 65.
0 Aug 65, 39p. Contract DA44 009AMC179X

Unclassified report

Descriptors: (*Power plants (Establishments), Brayton cycle), (*Generators, Test

facilities), (*Test facilities, Power plants), Oscillographs, Records

The document is comprised of oscillograph traces for use with AD-620 115.

AD-620 205 See Fld. 10

AD-620 251 Div. 8/1 ,25/3
CFSTI Prices: HC $3.00 MF $0.75
HUGHES AIRCRAFT CO CULVER CITY CALIF
THE COMPUTATION OF CYLINDRICAL PLASMA RADIATION PROBLEMS.
Scientific rept.,
by J. H. Harris, and J. Pachares. 0 Jun 65, 66p.
Rept. no. P65-79 ,SR-1
Contract AF19 628 4349 Proj. 4600 Task 460001
AFCRL , 65-610

Unclassified report

Descriptors: (*Antenna radiation patterns, Plasma sheath), (*Plasma sheath, Antenna radiation patterns), Hypersonic flight, Field theory, Bessel functions, Power series, Tables

Machine computation of the radiation patterns of antennas in cylindrical plasma environments is considered. General characteristics of the patterns are determined and are related to domains of the cylinder function arguments that enter into the field expressions. In this way, the effects on the computed patterns of various kinds of errors in the cylinder functions for arbitrary plasma properties are established. The manner in which errors enter into computed values for cylinder functions is discussed and methods of avoiding such errors are presented. Tables of Hankel functions of complex argument are included. The expected accuracy of the values in the tables is indicated. (Author)

AD-620 269 See Fld. 13/9

AD-620 380 Div. 8/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL ORDNANCE LAB CORONA CALIF
PROCEDURE FOR DEVELOPING OPTIMUM-BANDWITH WAVEGUIDE-TO-COAXIAL ADAPTERS.
Technical rept.,
by Fred H. Camphausen,Jr.. 6 Aug 65, 18p.
Task RM3743 003 211 1A107A0 03
NAVWEPS , 8815

Unclassified report

Descriptors: (*Waveguide couplers, Microwave equipment), (*Transmission lines, Adapters), Waveguides, Coaxial cables, Design, Bandwidth, Tolerances (Mechanics)

A simplified procedure for developing 10- to 30-GHz waveguide-to-coaxial adapters that have an optimum bandwidth is described. The procedure is mainly experimental but the shorting-plunger position is preset to the optimum bandwidth value as theoretically determined. Design details of a 17-GHz adapter with a subminiature connector are given. The effects of manufacturing tolerances on adapter performance are discussed. (Author)

AD-620 386 Div. 8/1
CFSTI Prices: HC $2.00 MF $0.50
OKLAHOMA UNIV NORMAN
THE FIELD INTENSITIES IN A SECTORAL HORN ANTENNA.
Master's thesis,
by Gary Lee Seasholtz. 01965, 47p. Contract AF33 608 1096

Unclassified report

Descriptors: (*Horn antennas, Electric fields), Intensity, Antenna radiation patterns, Boundary value problems, Field theory, Waveguides, Electromagnetic waves, Partial differential equations

Equations for the field intensities in a rectangular waveguide and a radial waveguide are derived. From these equations, the field intensities in the aperture of an E plane sectoral horn joined to a rectangular waveguide are derived for both the finite and infinite cases.

AD-620 460 Div. 8/1 ,8/6
CFSTI Prices: HC $2.00 MF $0.50
LINCOLN LAB MASS INST OF TECH LEXINGTON
SOME PROPERTIES OF A SCANNED CIRCULAR ARRAY.
Technical note,
by B. F. LaPage. 7 Jul 65, 42p. Rept. no. TN-1965-28
Contract AF19 628 5167
ESD , TDR-65-274

Unclassified report

Descriptors: (*Satellite antennas, Dipole antennas), (*Dipole antennas, Electromagnetic properties), Electrical impedance, Gain, Antenna radiation patterns, Antenna configurations, Scanning, Radio transmission

The impedance, pattern and gain properties of a circular array of dipoles (or isotropic sources) is discussed. In particular the variation of these properties as the antenna beam is scanned is investigated. Computed results for typical arrays are shown and the meaning of the results are discussed, and further areas of investigation are indicated. (Author)

AD-620 506 See Fld. 20/6

AD-620 511 See Fld. 10

AD-620 577 Div. 8/1 ,6/6
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
DEVELOPMENT OF COMPONENTS FOR X SUB A FREQUENCY BAND,
by R. G. Fellers. 0 May 47, 15p. Rept. no. NRL-3089

Unclassified report

Previously announced Apr 60 as PB-129 149, LC mi$2.40, ph$3.30.

Descriptors: (*Radar equipment, K band), (*Waveguides, X band), Waveguide couplers, Standing wave indicators, Attenuators, Signal generators, Wave analyzers, Mixers (Electronic), Standing wave ratios, Test equipment, Microwave equipment

R-F Components developed for the X sub a frequency band are described. This band covers the frequency range from 5200 to 5500 megacycles which utilizes a hitherto unused portion of the spectrum. Transmitter power should be increased over that available at X-band (9,000 megacycles) and antenna gain is greater than that at S-band (3,000 megacycles). This provides some advantage for the X sub a frequency over either of the two bands now in use. Components developed for the 1-1/2 in. x 3/4 in. x .064 in. wave guide include choke-flange connector, rotating joint, directional-coupler mixer, standing-wave indicator, wavemeters (two types) and a calibrated attenuator. These components are utilized in receiver and test equipment and have some transmitter applications. (Author)

AD-620 597 Div. 7/5
CFSTI Prices: HC $3.00 MF $0.75
MASSACHUSETTS INST OF TECH CAMBRIDGE DYNAMIC ANALYSIS AND CONTROL LAB
VALIDITY OF DESCRIBING-FUNCTION TECHNIQUES FOR THE ANALYSIS OF THIRD-ORDER RELAYOPERATED SERVOMECHANISMS.
Master's thesis,
by Gerald Wayne Meisenholder. 20 May 57, 60p.
Contract AF33 616 3398

Unclassified report

Descriptors: (*Servomechanisms, Mathematical analysis), Control systems, Feedback, Functions, Differential equations, Linear programming, Analog computers, Mechanical engineering, Electrical engineering

The relay-operated servomechanism oscillates at finite amplitudes and frequencies with its input equal to zero. These amplitudes and frequencies can be predicted by a special technique which replaces the relay by a quasilinear model called the describing function. To gain confidence and understanding in this type of technique, an analog computer was used to obtain exact solutions for the system and these were compared to solutions obtained by the describing function technique. In this thesis the solution comparisons are presented in a graphical form along with relay characteristic gain-phase plots, motor load gain-phase plots and an explanation of the describing function technique. Describing function predictions were found to be within ten percent of computer solutions for the great part, however, in the region of incipient oscillation results were consistantly poor. (Author)

AD-620 762 Div. 8/1
CFSTI Prices: HC $1.00 MF $0.50
FORMSPRAG CO WARREN MICH
H SUB 02 WAVE EXCITER IN A ROUND-SECTION WAVEGUIDE,
by M. V. Persikov. 12 Aug 65, 6p. Rept. no. FTD-TT-65-632
TT , 65-63819

Unclassified report

Unedited rough draft trans. of Patent (USSR) 156 975, appl. no. 776725/26-9, 3 May 62.

Descriptors: (*Waveguides, Excitation), Electromagnetic fields, Waveguide circulators, patents, USSR

An H sub 02 wave exciter is proposed in a waveguide with a round section which has the distinguishing feature that for the purpose of lessening the losses in the conversion and increasing the working range of the frequencies in a waveguide of round section there are provided uniformly distributed projections around the circumference which have uniform height being part of sectors smoothly changing in dimensions of cross section of the waveguide from an angle of aperture equalling zero up to the angle of 360 degrees.

AD-620 780 See Fld. 10

AD-620 801 See Fld. 3/1

10. ENERGY CONVERSION (NON-PROPULSIVE)

AD-620 114 Div. 7/6 ,7/5
CFSTI Prices: HC $6.00 MF $1.25
ARMY ELECTRONICS COMMAND FORT MONMOUTH N J
FUEL CELLS.
Status rept. no. 5,
by Stephen J. Bartosh, John M. McDonagh, and Walter G. Taschek. 0 Jun 65, 205p.

Unclassified report

Descriptors: (*Fuel cells, Reviews), Reports, Power supplies

Reviews are given on fuel cell research performed by U. S. and European organizations.

AD-620 205 Div. 7/6 ,7/5 ,4/4
CFSTI Prices: HC $3.00 MF $0.75
FLORIDA UNIV GAINESVILLE ENGINEERING AND INDUSTRIAL EXPERIMENT STATION
SOLUBILITY AND DIFFUSIVITY OF HYDROCARBONS AND OXYGEN IN FUEL CELL ELECTROLYTES.

Final rept.,
by Keith E. Gubbins. 30 Jun 65, 68p. Contract DA49 186AMC45X

Unclassified report

Rept. includes Appendix 1, Determination of Gas Solubilities in Electrolyte Solutions, by Stanley N. Carden and Robert D. Walker, Jr.

Descriptors: (*Fuel cells, Electrolytes), Gases, Solubility, Oxygen, Phosphoric acids, Sulfuric acid, Potassium compounds, Hydroxides, Aliphatic compounds, Hydrocarbons, Diffusion, Hydrogen, Diaphragms (Mechanics)

Experimental measurements of the solubility of oxygen in KOH, H2SO4 and H3PO4 solutions, and of straight-chain, saturated hydrocarbons in phosphoric acid have been made over the full electrolyte concentration range. The diffusion coefficient of oxygen in KOH solutions at 25 C and in 85% H3PO4 solutions at 60 and 80 C are also reported. A correlation for the solubility of gases in phosphoric acid solutions has been derived by dimensional analysis, and shown to fit the measured values within the limits of experimental error. The correlation presented should enable the solubility of oxygen and hydrocarbons in 85-105% H3PO4 to be predicted with reasonable accuracy. The values of the diffusivity of oxygen in KOH have been shown to obey the theory of Ratcliff (G. A. Ratcliff and J. G. Holdcroft. Trans. Instr. Chem. Engr. (London), 41:315 (1963)). A correlation for the diffusion coefficient of gases in phosphoric acid solutions has been derived, but insufficient experimental data was obtained for a test of the correlation to be made. (Author)

AD-620 511 Div. 7/6 ,7/5
CFSTI Prices: HC $1.00 MF $0.50
GENERAL ATOMIC DIV GENERAL DYNAMICS CORP SAN DIEGO CALIF
THERMIONIC REACTOR RELIABILITY,
by J. W. Holland. 28 Jun 65, 13p. Rept. no. GA-6373
Contract NObs90487 Proj. arpa order 21964PC4980

Unclassified report

Prepared for presentation at the International Conference on Thermionic Electrical Power Generation, London, England, 20-24 Sep 65.

Descriptors: (*Thermionic converters, Reliability), Electric power production, Networks

Thermionic converter network reliability is determined as a function of the network electrical configuration and the converter reliability. The study shows that the most reliable configuration is the matrix type of network, with series-connected converters cross-connected in parallel between converters so that an alternate path for electrical current is provided in the event of an open-circuit failure. It was found that with an optimized cross-connector, the most reliable matrix has about three times as many cells in series as in parallel, which conveniently coincides with the advantage of high voltage production. By supplying a small amount of redundant power to the network at the beginning of operation, matrix reliabilities can be orders of magnitude higher than the reliability of the converters. (Author)

AD-620 650 Div. 7/6 ,7/3 ,21/8 ,20/5
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP SANTA MONICA CALIF
OUT-OF-PILE THERMIONIC SPACE POWER SYSTEMS USING A GASEOUS HEAT-TRANSFER FLUID,
by Anthony Leonard. 0 Sep 65, 50p. Rept. no. RM-4469-PR
Contract AF49 638 700

Unclassified report

Descriptors: (*Thermionic converters, Gas-cooled reactors), (*Space propulsion, Nuclear propulsion), Creep, Rupture, Heat transfer, Helium, Neon, Electric propulsion, Optimization, Calculus of variations

A study of the potential of space power systems composed of a high-temperature gas-cooled reactor and outof-pile thermionic converters. Emphasis is placed on the creep-rupture problem and the optimization of the radiator-converter configuration. Expressions for thermionic-converter efficiency and power density as a function of emitter temperature and collector temperature are developed. For a system using 750-psi helium at a maximum gas temperature of 3600 1/4F, a specific mass of about 13 lb/kw is estimated, excluding power conditioner and shield masses. A 1000-psi system using neon would have a specific mass of about 17 lb/kw. (Author)

AD-620 780 Div. 7/6 ,7/5
BATTELLE MEMORIAL INST COLUMBUS OHIO
RADIOISOTOPE-FUELED THERMOELECTRIC GENERATORS,
by William E. Kortier, and Meyer Pobereskin. 01964, 7p.

Unclassified report

Pub. in the Battelle Technical Review Dec 1964. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Thermoelectricity, Radioactive isotopes), (*Radioactive isotopes, Thermoelectricity), Power sources, Generators, Design, Heating, Spaceborne

A discussion is given which includes the following topics: Current status of radioisotope-fueled thermoelectric generators; rudiments of system design; radioisotopes as power sources; advanced developments; improving thermoelectric elements by segmenting; high power-density radioisotope heat sources; heat source support.

10/3. ENERGY STORAGE

AD-620 123 Div. 7/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
METHOD OF MANUFACTURING POSITIVE ELECTRODES FOR SILVER-ZINC BATTERIES,
by V. V. Romanov. 4 Jun 65, 4p. Rept. no. FTD-TT-65-185
TT, 65-63341

Unclassified report

Unedited rough draft trans. of Russian patent 138283, pub. 30 Dec 60, appl. 691380/24.

Descriptors: (*Anodes, Storage batteries), Silver, Powder metals, Zinc, Electrodes, Cellulosic plastics, Packaging, Protective treatments, Films, Magnesium compounds, Hydroxide, USSR, Patents

The object of the invention is a method of preparing the positive electrodes of silver-nickel storage batteries through the pressing of a silver powder and the wrapping of the electrode with a cellophane separation. For the purpose of increasing the stability of the cellophane as against the oxidizing action of silver oxides, which are formed in recharging, and the oxygen liberated in the recharging, a thin layer of magnesium hydroxide is pressed on both sides of the electrode. (Author)

AD-620 212 Div. 7/1 ,10/6
CFSTI Prices: HC $4.00 MF $0.75
UNIDYNAMICS/PHOENIX ARIZ
RESEARCH AND DEVELOPMENT DIRECTED TOWARD THE DEVELOPMENT OF GAS GENERATORS.
Final rept. for Jul 61-May 63,
by F. Schumacher, and D. Fyfe. 15 Aug 65, 102p. Rept. no. D63-702
Contract DA36 039SC87362 Proj. 1C6 22001A053 Task 1C6 22001A053 02

Unclassified report

Descriptors: (*Gas generating systems, Propellants), (*Propellants, Gas generating systems), (*Batteries + components, Gas generating systems), Propellant grains, Ignition, Electric igniters, Stability, Thermal properties, Environmental tests, Performance (Engineering), Ammonium compounds, Perchlorates, Acrylic resins, Carboxylic acids, Guanidine nitrates, Carbon black, Oximes

The purpose of this project is to develop improved gas generators to activate zinc-silver oxide batteries employing the Signal Corps metal-tube electrolytereservoir activating system. The results of the propellant investigation indicated that one commercial propellant, B.F. Goodrich C-501, and a Unidynamics formulation N-1825B, exhibited the most satisfactory thermal stability and reproducible gas output and pressure-vs-time characteristics after conditioning at 300F for 168 hours. However, N-1825B propellant was selected for use in the gas generator since it is easily furnished with center perforations and exhibits a low content of hydrochloric acid in its exhaust gases. During gas generator design and development, sealed matches with delays of 0, 0.2, and 0.4 seconds were developed which provided outputs sufficient to ignite the propellant charge. In addition, theoriginal design of the gas generators was modified to incorporate a grain trap nozzle and provide base plug end ignition. A satisfactory test fixture was fabricated for pressurevs-time and output testing.

AD-620 296 Div. 7/1 ,4/4
CFSTI Prices: HC $1.00 MF $0.50
OREGON STATE UNIV CORVALLIS DEPT OF CHEMICAL ENGINEERING
ELECTRODE REACTIONS AND RATE PROCESSES IN NONAQUEOUS ELECTROLYTES.
Final rept. for 16 Feb 61-30 Jun 65,
by Robert E. Meredith. 1 Aug 65, 9p. Contract N123 62738 26840A ,N123 62738 32774A Task RMM022 030 211 1F009 08 001
NAVWEPS, 8825

Unclassified report

Descriptors: (*Electrolytes, Thermodynamics), (*Electrochemistry, Electrolytes), High-temperature research, Zirconium compounds, Oxides, Reaction kinetics, Electrolytic cells, Storage batteries, Electrodes, Low-temperature research, Sulfer compounds, Dioxides, Lithium, Calcium, Magnesium, Sodium, Potassium, Iodine compounds, Bromides, Bromine, Zinc, Iron, Nickel, Cobalt

Research was concerned with two projects in nonaqueous electrochemistry. One project investigated high-temperature thermally activated voltaic cells with solid electrolytes; the other investigated low-temperature cells in liquid sulfur dioxide. Optimization of the fabrication of stabilized zirconia electrolytes, the vapor deposition of anode metals, and the evaluation of oxygen cathodes in cells at high temperatures were principal investigations in the thermally activated systems. Iuvestigations of suitable reference electrodes, electrolytic conductivity, polarization parameters, and voltaic-cell investigations were made in liquid sulfur dioxide. (Author)

AD-620 552 Div. 7/1 ,4/4
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
INVESTIGATION OF THE PLATE MATERIALS OF THE LEAD ACID CELL: COMPOUND FORMATION BETWEEN LEAD MONOXIDE AND LEAD SULFATE.
Rept. no. 1,
by J. J. Lander. 22 Mar 48, 24p. Rept. no. NRL-3262

Unclassified report

Previously announced 31 Aug 53 as PB-109 747, LC mi$2.00, ph$3.75.

Descriptors: (*Storage batteries, Materials), (*Lead compounds, Electrochemistry), Phase studies, Synthesis (Chemistry), X-ray diffraction analysis, Decomposition, Monoxides, Sulfates

As the initial phase in the study of the active material of the plates of the lead-acid cell, the formulas of the compounds (basic sulfates) formed between PbO, and PbSO4 were checked or established. The phase diagram for the melts of these substances shows formation of the compounds: PbSO4.4PbO, PbSO4.2PbO, and PbSO4.PbO. A wet method of preparation leads to formation of the compounds: PbSO4.4PbO, PbSO4.PbO, and a hydrous compound tentatively assigned the formula: PbSO4. 3PbO.H2O. X-ray methods of analysis support these formulas. X-ray diffraction patterns were recorded for these compounds for use in identification work. The nature of the thermal decomposition products of PbSO4.2PbO and the hydrous compound were determined by X-ray analysis to be a mixture of PbSO4.4PbO and PbSO4.PbO in each case. (Author)

11/1. ADHESIVES AND SEALS

AD-620 124 See Fld. 13/8

11/2. CERAMICS, REFRACTORIES, AND GLASSES

AD-620 335 Div. 14/2 ,12/3
CFSTI Prices: HC $6.00 MF $1.25
ILLINOIS UNIV URBANA DEPT OF CERAMIC ENGINEERING
CRITICAL LITERATURE SURVEY OF MISSILE BLAST RESISTANT MATERIALS.
Final rept. for 1 Jun 64-1 Aug 65,
by W. L. Augur, F. E. Richter, and A. W. Allen.
0 Jun 65, 217p. Rept. no. 6-1
Contract DA33 017CIVENG64 7
Unclassified report

Descriptors: (*Refractory materials, Reviews), (*Blast, Guided missile launchers), Thermal radiation, Ceramic materials, Refractory coatings, Ablation, Launching sites, Thrust

A literature survey was conducted to study the criterion for the utilization of refractory materials for thermal protection of launch facilities. Sources were surveyed from the viewpoint of the refractories engineer including: (1) published literature relating to refractory materials in general; (2) literature relating to specific applications under simulated or actual launch conditions; (3) preliminary contacts with refractories manufacturers and engineering departments; (4) preliminary contacts with government agencies and facilities working in this or related problem areas. A historical review traced the development of the subject from the early use on aircraft runway pavement to present missile sites. Kennedy Space Center inspections and Ohio River Divison Laboratory Programs were used as examples to characterize the problems involved. (Author)

AD-620 572 See Fld. 18/8

AD-620 573 See Fld. 18/8

AD-620 797 Div. 14/2 ,25/8
AEROSPACE RESEARCH LABS OFFICE OF AEROSPACE RESEARCH WRIGHT-PATTERSON AFB OHIO
PHASE RELATIONS IN THE SYSTEM BORON OXIDESILICA.
Revised ed.,
by T. J. Rockett, and W. R. Foster. 4 Aug 64, 8p.
Rept. no. ARL-65-134
Contract AF33 616 6509
Unclassified report

Pub. in Journal of American Ceramic Society v48 n2 p75-80 Feb 1965 (Copies not available to DDC or Clearinghouse customers). Presented at the Annual Meeting of the American Ceramic Society (65th), Pittsburgh, Pa., on Apr 30 1963. Prepared in cooperation with Ohio State Univ., Columbus. Dept. of Mineralogy. Revision of manuscript submitted 27 Apr 64.

Descriptors: (*Phase studies, Boron compounds), (*Boron compounds, Silicon compounds), (*Glass, Phase studies), Oxides, Dioxides

The suggested phase diagrams for the system B2O3SiO2 as drawn from the findings of previous investigators are presented. These diagrams show the wide controversy regarding this system. The principal difficulties in obtaining reliable equilibrium data are the volatilization of B2O3, the hydration of B2O3-rich glasses, and the great viscosity of B2O3-SiO2 melts. In this investigation firings were made in sealed platinum capsules. Where necessary, they were opened and studied under xylene to eliminate hydration. Phases were identified by optical and X-ray methods. The liquidus was obtained by determination of the temperatures at which the stable phases of SiO2 completely dissolved in the borosilicate melts. The criteria used for equilibrium are discussed. (Author)

AD-620 808 See Fld. 13/8

11/3. COATINGS, COLORANTS, AND FINISHES

AD-620 125 Div. 14/7
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
METHOD OF PRODUCING A HEAT-RESISTANT SCAPOLITE ELECTRICAL-INSULATION LACQUER,
by A. D. Grigorev. 11 Jun 65, 5p. Rept. no.
FTD-TT-65-193
TT , 65-63343
Unclassified report

Unedited rough draft trans. of Russian Patent 161832, pub. 20 Apr 63, appl. 832174/23-4.

Descriptors: (*Varnishes, Electric insulation), (*Electric insulation, Varnishes), USSR, Patents, Heat-resistant materials, Synthetic rubber, Mineral products, Solvents, Antioxidants, Plasticizers

The object of the invention is a method of obtaining a heat-resistant scapolate electrical-insulation lacquer on the basis of oxidized sodium-butadiene rubber SKBrd and scapolite compound EKB-1, plasticized by vegetable and mineral oils, with the addition of a solvent and inhibitor of oxidation. To improve the resistance of the polymers of oxidation triphenylmethane-triisocyanate is introduced in the amount of from 35 to 150 parts by weight as an oxidation inhibitor. (Author)

AD-620 355 Div. 14/7 ,14/8 ,14/9
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
STUDIES TO IMPROVE THE WEAR DURABILITY OF POLYTETRAFLUOROETHYLENE (TEFLON) COATINGS ON ELASTOMERIC VULCANIZATES.
Interim rept.,
by A. G. Sands, and E. J. Kohn. 30 Jul 65, 22p.
Rept. no. NRL-6298
Proj. RR001 02 43 4800
Unclassified report

Descriptors: (*Halocarbon plastics, Plastic coatings), (*Ware resistance, Halocarbon plastics), (*Plastic coatings, Elastomers), (*Elastomers, Plastic coatings), Vulcanizates, Sintering, Adhesion, Friction, Rubber, Synthetic rubber

Methods for improving the wear durability of polytetrafluoroethylene (TFE) coatings on vulcanized elastomeric substrates have been investigated. A high-temperature flame-sintering technique has been developed which substantially improves the abrasion resistance of the TFE coatings, even in contact with rough surfaces such as 12-oz duck canvas. The flame-sintered TFE coatings exhibited a high order of durability in contact with smooth steel and anodized aluminum surfaces. Nonanodized aluminum surfaces were severely abraded by the TFE coatings. The flame-sintering treatment did not appreciably degrade the physical properties of most of the elastomers studied, nor did it adversely affect the frictional properties of the TFE coatings. Stabilizers utilized in gum neoprene and acrylonitrile elastomers tended to interfere in the adhesion of the TFE coating, but cleaning the surface of the vulcanizate with an aromatic solvent prior to application of the coating improved the adhesion. A thin evaporated reflective aluminum film on the elastomer substrate provided an effective interfacial heat barrier for sintering TFE coatings with infrared heat. Vulcanizates coated only with TFE were burned and charred using this heat source. More work is needed, however, to improve the abrasive resistance of this combination of coatings.

AD-620 544 See Fld. 7/3

11/6. METALLURGY AND METALLOGRAPHY

AD-620 136 Div. 17/5 ,17/2
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
THE COOLING TRANSFORMATIONS IN CERTAIN URANIUM-BEARING STEELS.
Interim rept.,
by E. P. Klier, and J. R. Hawthorne. 28 Jun 65,
19p. Rept. no. NRL-6240
Contract AT49 5 2110 Proj. SR007 01 01
0858,RR007 01 46 Task 5409
Unclassified report

Descriptors: (*Steel, Transformations), Cooling, Uranium alloys, Hardness, Metallography, Phase studies, Microstructure, Bainite, Ferrites, Pearlite, Martensite

The continuous cooling transformation of three laboratory heats, containing 0, 0.06, and 1.1 percent natural uranium (U), and of a uranium-free commercial heat, following austenitizing at 1650 and 1750 F, have been investigated. The melts were prepared to the nominal composition for ASTM A212-B steel. Hardness measurements, as well as metallographic examinations, of the transformed structures were included in this study. The two uranium-free steels yielded very similar cooling-transformation diagrams and exhibited essentially equivalent hardenability; however, the hardenability of the uranium-free commercial heat was limited by ferrite and upper bainite formation, while that of the laboratory heat was restricted by pearlite formation. Uranium additions of 0.06 and 1.1 percent were not found to have any significant effect upon hardenability although, unlike the uranium-free laboratory heat, the hardenability of these steels was limited by upper bainite formation. Suppression of the proeutectoid ferrite reaction at intermediate cooling rates was observed to increase with uranium content. Metallographic examinations of the 1.1-percent U steel revealed a stringer dispersion of a micro-constituent, possibly Fe2U, in all structures produced over the range of cooling conditions employed. The volume of this phase was small, however, and thus is not believed to have a serious effect on austenite decomposition when quenching. (Author)

AD-620 161 Div. 17/2 ,25/6
CFSTI Prices: HC $2.00 MF $0.50
JET PROPULSION LAB CALIF INST OF TECH PASADENA
PLASTIC STRAINS AND ENERGY DENSITY IN CRACKED PLATES. PART II. COMPARISON WITH ELASTIC THEORY,
by J. L. Swedlow, and W. W. Gerberich. 01964,
34p. Rept. no. 873
Contract NAS7 100
Unclassified report

Prepared in cooperation with Philco, Blue Bell, Pa. Research Labs. Presented at SESA (Society for Experimental Stress Analysis) Spring Meeting, Salt Lake City, Utah, 6-8 May, 1964.

Descriptors: (*Metal plates, Fracture (Mechanics)), Ductility, Elasticity, Theory, Strain (Mechanics), Plasticity, Sheets, Deformation

Data from the ductile materials reported in Part I are compared to planar elastic results. The experimental and theoretical strains are markedly different, both in angular distribution and in decay with distance from the crack tip. The distortional energy density data also differ with theory, in terms of angular distribution, but their radial behavior is closer to the inverse distance relation of elasticity. The total plastic energy release rate is inferred from the data; it is considerably in excess of the critical rate, the Giffith strain energy release rate for onstable crack extension. This disparity is discussed in terms of the regions where energies are released. (Author)

AD-620 165 Div. 17/4 ,31/4
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
FRACTURE TOUGHNESS CHARACTERISTICS OF SOME TITANIUM ALLOYS FOR DEEP-DIVING VEHICLES.
Interim rept.,
by Robert J. Goode, and Ralph W. Huber. 28 Jul 65, 13p. Rept. no. NRL-6255
Proj. SR007 01 02 0704 ,RR007 01 46 5405
Unclassified report

Rept. presented at the Metallurgical Society/AIME Session on 'The Development and Status of Titanium Alloys for Deep-Diving Vehicles,' Philadelphia, Pa., Oct 64.

Descriptors: (*Titanium alloys, Fracture (Mechanics)), (*Submarine hulls, Titanium alloys), Toughness, Metal plates, Aluminum alloys, Tin alloys, Niobium alloys, Tantalum alloys, Zirconium alloys, Vanadium alloys, Molybdenum alloys, Chromium alloys, Mechanical properties, Fractography

The notch-fracture-toughness characteristics of a wide variety of titanium alloy plate are being investigated to provide alloy selection design and specification criteria for the use of titanium alloys as hull-materials for deep-diving submarines and other structural applications. The relationships between various standard and newly developed fracture-toughness tests have been established for one-inchthick rolled plate, and the results from these tests have been correlated to the performance of the material in a structural prototype element test. A preliminary fracture diagram is presented for titanium which relates fracture toughness to strength level and the performance of the material in the structural prototype element test in the presence of flaws. The optimum materials trend line has been established, which indicates the maximum strength level for any given level of toughness. The fracturetoughness characteristics of a number of titanium alloys and their relationship to the optimum materials trend line have been delineated. Results of the alloy development and processing investigation provide useful guidelines for optimization of strength and toughness of titanium alloys. (Author)

AD-620 181 Div. 17/4 ,26/1
CFSTI Prices: HC $1.00 MF $0.50
ARMY MATERIALS RESEARCH AGENCY WATERTOWN MASS
THE EFFECT OF SOLUTION TEMPERATURE ON MECHANICAL PROPERTIES AND MICROSTRUCTURE OF 6A1-6V-2SN TITANIUM ALLOYS,
by Ellsworth H. Swift, Armando A. Iannelli, and F. J. Rizzitano. 0 May 65, 14p. Rept. no. AMRA-TR-65-11
Proj. DA-51215030 Task 36931
Unclassified report

Descriptors: (*Titanium alloys, Heat treatment), (*Heat treatment, Titanium alloys), Aluminum alloys, Vanadium alloys, Tin alloys, Mechanical properties, Microstructure, Temperature, Transition temperature

A series of tests were conducted to determine the effect of solution temperature on the mechanical properties and microstructure of commercial-grade titanium alloy 6A1-6V-2Sn. The solution temperature was varied from 1500 F to 2200 F. The solution time, aging time, and temperature were held constant. It is concluded that optimum strength-ductility-toughness combinations are obtained at solution temperatures of 1575 F to 1600 F. Lower solution temperatures decrease the tensile and yield strengths, and higher solution temperatures show a sharp decrease in ductility and impact strength. The beta transus temperature is 1720 F. (Author)

AD-620 188 Div. 17/2 ,25/2 ,17/1 ,17/6
CFSTI Prices: HC $3.00 MF $0.75
FRANKLIN INST RESEARCH LABS PHILADELPHIA PA
FLOW AND FRACTURE STUDIES OF HIGH PURITY AND ALLOYED BERYLLIUM.
Final technical rept.,
by M. Herman, D. Hoover, V. Damiano, R. Pyle, and G. S. Tint. 0 Aug 65, 60p. Rept. no. F-B2205
Contract NOw64 0437d Proj. F-B2205
Unclassified report

See also AD-620 241.

Descriptors: (*Deformation, Beryllium), (*Beryllium, Crystallography), (*Beryllium alloys, Crystallography), (*Fracture (Mechanics), Beryllium), Strain (Mechanics), Crystals, Single crystals, Zone melting, Crystal lattice defects, Stresses, Copper alloys, Mathematical analysis, Laboratory equipment, Grinders

Contents: Single crystal deformation studies of pure and alloyed crystals, zone refining work which deals with the purification and alloying of beryllium and the perfecting of an automated control system for zone melting, preparation of pure and alloyed polycrystalline beryllium, theoretical calculation of the stress required to initiate slip on selected crystallographic planes in beryllium, description of a single crystal orienter which was constructed to facilitate the preparation of accurately oriented compression specimens.

AD-620 214 Div. 17/5 ,14/8 ,14/9 ,14/5 ,+
CFSTI Prices: HC $1.00 MF $0.50
ARMY MATERIALS RESEARCH AGENCY WATERTOWN MASS
MATERIALS ENGINEERING FOR COLD REGIONS AND THE BRITTLE FRACTURE PROBLEM.
Monograph series,
by Murray M. Jacobson. 0 Aug 65, 19p. Rept. no. AMRA-MS-65-05
Unclassified report

Presented at the Alaskan Science Conference American Association for the Advancement of Science (15th), College, Alaska, 31 Aug-4 Sep 64.

Descriptors: (*Metals, Low-temperature research), (*Materials, Low-temperature research), (*Brittleness, Low-temperature research), Alloys, Elastomers, Rubber, Plastics, Lubricants, Fracture (Mechanics), Ductility, Toughness, Cold weather tests

Most rubber and plastics materials lose flexibility and become dangerously embrittled in cold regions, although certain classes of these nonmetallic engineering materials are available which are serviceable even at extremely low temperatures. Low temperature mechanical behavior of a metal can be correlated with its intrinsic crystallographic structure. In addition to crystal structure, factors such as chemical composition, purity, heat treatment and processing variables influence behavior of metallic materials at low temperatures. In cold environment, most engineering metals actually become stronger, but they lose ductility and become dangerously brittle. Thus, the major problem at low temperatures is brittle fracture. The presence of notch defects, particularly in the case of high strength alloys, plays a predominant role in contributing to sudden brittle fracture. The V-notch Charpy impact test has been used effectively as an inspection criterion for screening brittle materials for armor, cannon and other military applications. Parameters based on rational fracture mechanics concepts, although not yet adequate for prevention of brittle behavior.

AD-620 234 **See Fld. 13/8**

AD-620 238 Div. 17/2 ,17/1 ,25/2 ,17/6
CFSTI Prices: HC $2.00 MF $0.50
FRANKLIN INST RESEARCH LABS PHILADELPHIA PA
FLOW AND FRACTURE STUDIES OF HIGH PURITY AND ALLOYED BERYLLIUM.
Quarterly technical progress rept. for 6 Apr-5 Jul 64,
by M. Herman, D. Hoover, V. Damiano, and R. Pyle. 5 Jul 64, 35p. Rept. no. Q-B2205-1
Contract NOw64 0437d
Unclassified report

See also AD-620 188.

Descriptors: (*Deformation, Beryllium), (*Beryllium, Crystallography), (*Zone melting, Beryllium), (*Fracture (Mechanics), Beryllium), Single crystals, Crystal growth, Fracture (Mechanics), Forging, Rolling (Metallurgy), Crystal lattice defects, Impurities, Carbon, Tensile properties, Microstructure, Strain (Mechanics)

An investigation was made to produce high purity beryllium and beryllium alloys and to determine their deformation and fracture properties in the single crystal and polycrystalline states.

AD-620 241 Div. 17/2 ,17/1 ,25/2 ,17/6
CFSTI Prices: HC $1.00 MF $0.50
FRANKLIN INST RESEARCH LABS PHILADELPHIA PA
FLOW AND FRACTURE STUDIES OF HIGH PURITY AND ALLOYED BERYLLIUM.
Quarterly technical progress rept. for 7 Jul-6 Oct 64,
by M. Herman, D. Hoover, V. Damiano, and R. Pyle. 6 Oct 64, 15p. Rept. no. Q-B-2205-2
Contract NOw64 0437d
Unclassified report

See also AD-620 188.

Descriptors: (*Deformation, Beryllium), (*Beryllium, Crystallography), (*Beryllium alloys, Crystallography), (*Zone melting, Beryllium), Copper alloys, Single crystals, Crystals, Crystal lattice defects, Stresses

An investigation was made to study the deformation and fracture characteristics of high purity and alloyed beryllium in single crystal and polycrystalline form. Progress is reported in zone melting beryllium, the automating of a 1 in diameter zone melter, and the preparing of a polycrystalline beryllium-copper alloy is presented. In addition, a series of experiments designed to detect slip out of the basal plane is presented and interpreted.

AD-620 264 Div. 17/2 ,17/1 ,25/2 ,17/6
CFSTI Prices: HC $3.00 MF $0.75
FRANKLIN INST RESEARCH LABS PHILADELPHIA PA
PREPARATION AND EVALUATION OF HIGH PURITY BERYLLIUM.
Final technical rept. for 15 Oct 63-14 Jan 64,
by G. E. Spangler, M. Herman, D. B. Hoover, and V. V. Damiano. 14 Jan 64, 98p. Rept. no. F-B2089
Contract NOw63 0500d
Unclassified report

See also AD-620 188.

Descriptors: (*Deformation, Beryllium), (*Beryllium, Crystallography), (*Fracture (Mechanics), Beryllium), (*Zone melting, Beryllium), Single crystals, Crystal lattice defects, Tensite properties, Stresses, Crystals, Microstructure, Diffusion, Mechanical working, Heat treatment, Impurities

Contents: zone refining, mechanical property evaluation of single crystals, polycrystalline beryllium, dislocation structures and slip line markings in deformed single crystals of beryllium, basal plane fracture of beryllium single crystals, self diffusion in beryllium single crystals, zone refining heat control system.

AD-620 329 Div. 17/2 ,17/6
CFSTI Prices: HC $1.00 MF $0.50
PITMAN-DUNN INST FOR RESEARCH FRANKFORD ARSENAL PHILADELPHIA PA
THE STRESS CORROSION AND ELEVATED TEMPERATURE PROPERTIES OF MAGNESIUM-LITHIUMSILICON ALLOYS,
by Anthony Saia, and Ralph E. Edelman. 0 Oct 64, 17p. Rept. no. A64-31
Proj. DA 1C024401A328
Unclassified report

Presented at the Annual Meeting, Magnesium Association (21st), at New York, 'Performance thru Lightness,' 5-7 Oct 64.

Descriptors: (*Magnesium alloys, Corrosion), (*Corrosion, Magnesium alloys), (*Lithium alloys, Magnesium alloys), Silicon alloys, Silver alloys, Zinc alloys, High-temperature research, Tensile properties, Stresses, Microstructure

Silicon additions improved the stress corrosion resistance of magnesium-lithium alloys in the as-quenched condition. In the stabilized condition, none of the alloys, with or without silicon exhibited any stress corrosion. The silicon-bearing alloys investigated exhibited improved elevated temperature properties over the alloys without silicon. (Author)

AD-620 393 See Fld. 20/12

AD-620 508 See Fld. 13/8

AD-620 509 See Fld. 13/8

AD-620 513 Div. 17/2
CFSTI Prices: HC $3.00 MF $0.75
RIAS INC BALTIMORE MD
ON THE MECHANISM (S) OF STRESS-CORROSION CRACKING.
Technical rept.,
by E. N. Pugh. 0 Aug 65, 66p. Rept. no. TR-65-7 ,TR-1
Contract DA31 124ARO D258 Proj. DA 20014501B32D
AROD , 5023:1
Unclassified report

Descriptors: (*Fracture (Mechanics), Corrosion), (*Corrosion, Stresses), Brass, Aluminum, Theory, Mathematical analysis, Grain boundaries, Creep

A critical review was made of some of the major theories of stress-corrosion cracking, with particular reference to the long-standing question of whether a single, generalized mechanism exists. It is concluded, largely on the basis of recent studies of alpha-brass and of aged aluminum alloys, that several different mechanisms are in fact operative in different systems, so that stress-corrosion cracking must be regarded as a generic term. Consideration is given to areas which require further study. (Author)

AD-620 521 See Fld. 20/2

AD-620 526 See Fld. 13/8

AD-620 530 See Fld. 20/12

AD-620 556 See Fld. 13/8

AD-620 557 See Fld. 13/8

AD-620 558 See Fld. 13/8

AD-620 560 Div. 17/5 ,26/1
CFSTI Prices: HC $2.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
THE EFFECT OF TITANIUM AND VANADIUM ON THE MECHANICAL PROPERTIES AND WELDABILITY OF EXPERIMENTAL LOW-ALLOY HIGH-TENSILE STEEL,
by George G. Luther, Carl E. Hartbower, and Donald B. Roach. 23 Nov 48, 43p. Rept. no. NRL-3343
Unclassified report

Previously announce 15 May 53 as PB-111 135, LC mi$2.50, ph$5.25.

Descriptors: (*Steel, Mechanical properties), (*Titanium alloys, Steel), (*Vanadium alloys, Steel), (*Welding, Steel), Manganese alloys, Tensile properties, Fracture (Mechanics), Hardness, Ductility, Microstructure, Transition temperature

Tensile properties, maximum underbead hardness, underbead cracking, weldability according to the nickbend specimen, and notch sensitivity as determined by V-notch Charpy bar were the means of evaluating the relative performance of steels in both the as-rolled and normalized conditions. Investigation showed that small variations in amount of titanium or vanadium produced a marked effect on the temperature of transition from ductile to brittle behavior. (Author)

AD-620 564 Div. 17/7
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
DEVELOPMENT OF THE PHYSICAL AND CHEMICAL PROPERTIES OF THE SODIUM-POTASSIUM ALLOY.
Quarterly progress rept. no. 8,
by Curtis T. Ewing, Robert E. Seebold, Joseph A.Grand, and Harold B. Atkinson,Jr.. 9 Aug 48, 13p. Rept. no. NRL-3330
Unclassified report

Previously announced 2 Apr 54 as PB-113 040, LC mi$1.75, ph$2.50.

Descriptors: (*Alkali metal alloys, Physical properties), (*Sodium alloys, Potassium alloys), (*Potassium alloys, Sodium alloys), Surface tension, Thermal conductivity, Specific heat, Chemical properties, Test equipment

Status of active property measurements and all measured results obtained since the preceding Quarterly Report are presented; apparatuses for measurement of specific heat, thermal conductivity, and surface tension are described.

AD-620 568 See Fld. 13/8

AD-620 572 See Fld. 18/8

AD-620 573 See Fld. 18/8

AD-620 589 Div. 17/2 ,17/1 ,25/2 ,17/6
CFSTI Prices: HC $1.00 MF $0.50
FRANKLIN INST RESEARCH LABS PHILADELPHIA PA
FLOW AND FRACTURE STUDIES OF HIGH PURITY AND ALLOYED BERYLLIUM.
Quarterly technical progress rept. for 7 Oct 64-6 Jan 65,
by M. Herman, G. London, V. Damiano, and G. S. Tint. 6 Jan 65, 14p. Rept. no. Q-B2205-3
Contract NOw64 0437d
Unclassified report

See also AD-620 188.

Descriptors: (*Deformation, Beryllium), (*Beryllium, Deformation), (*Beryllium alloys, Copper alloys), (*Zone melting, Beryllium), Single crystals, Stresses, Mathematical analysis, Creep, Shear stresses, Crystal lattice defects, Crystallography

The progress in zone melting and the preparing of a Be-Cu alloy is presented. In addition a theoretical analysis is presented on the stress required to initiate plastic flow on selected slip planes in beryllium.

AD-620 679 Div. 17/4 ,25/2
CFSTI Prices: HC $1.00 MF $0.50
NEVADA UNIV RENO DEPT OF PHYSICS
FIELD EMISSION STUDIES OF THE SURFACE CONSTANTS OF REFRACTORY METALS.
Final rept.,
by Philip C. Bettler. 20 Aug 65, 25p. Contract AF AFOSR62 297
AFOSR , 65-1688
Unclassified report

Descriptors: (*Rhenium, Field emission), (*Tungsten, Field emission), (*Field emission, Refractory metals), Surface tension, Crystal structure, Diffusion, Theory, Metallic crystals

The activation energy for surface migration, the surface tension, and the diffusivity constant for surface motion were measured, using field emission techniques, for tungsten (bcc) and rhenium (hcp). The values for tungsten agree well with results reported by other investigators. Similar work on rhenium was not reported previously. Investigations are continuing on other metals with face centered cubic and hexagonal close packed crystal structure. (Author)

AD-620 687 Div. 17/2 ,17/4
CFSTI Prices: HC $4.00 MF $1.00
MASSACHUSETTS INST OF TECH CAMBRIDGE METALS PROCESSING LAB
DEFORMATION PROCESSING OF ANISOTROPIC METALS.
Final rept.,
by W. A. Backofen, D. H. Avery, and D. Lee. 15 Jul 65, 137p. Contract NOw65 0124d
Unclassified report

See also AD-611 832.

Descriptors: (*Titanium alloys, Deformation), (*Deformation, Metals), Aluminum alloys, Tin alloys, Sheets, Plasticity, Tensile properties, Strain (Mechanics), Creep, Crystal structure, Crystal lattice defects, Metallography, Hardening

Titanium of commercial purity (RC-70) and two allalpha (HCP) alloys (4Al-1/402 and 5Al-2.5Sn) were tested in sheet form under conditions of combined-stress loading. Plane-strain compression and plane-strain tension together with uniaxial compression and tension provided information for constructing the tension-tension and compression-compression quadrants of the plane-stress yield locus. The deformation of textured sheet of titanium and several of its all-alpha (HCP) alloys was investigated with basically two kinds of experiments: tension testing along different directions in the plane of the sheet and combinedstress loading along principal axes of anisotropy (the rolling and transverse directions). Texture and plastic anisotropy were evaluated with pole figures and by measurement, as a function of orientation, of the tensile transversestrain ratio, or R parameter. A phenomenological explanation of superplasticity in metals has been based on the observation of a strong strain-rate dependence of flow stress, com-

parable to that of heated polymers and approaching that of hot glass. A structural basis for such high rate sensitivity is suggested in the present paper. It is argued that at temperatures about 0.5T sub m two competitive processes contribute to deformation.

AD-620 733 See Fld. 20/12

AD-620 745 Div. 17/4 ,17/2
CFSTI Prices: HC $1.00 MF $0.50
ARMY MATERIALS RESEARCH AGENCY WATERTOWN MASS
LOW-TEMPERATURE MECHANICAL PROPTIES AND FRACTURE TOUGHNESS OF TI-6AL-6V-2SN.
Technical rept.,
by Thomas S. DeSisto, and Charles F. Hickey Jr..
0 Jul 65, 18p. Rept. no. AMRA-TR-65-17
Proj. DA 1C024401A110
Unclassified report

Presented at the Annual Meeting of American Society for Testing and Materials at Purdue Univ., Lafayette, Ind., 17 Jun 65.

Descriptors: (*Titanium alloys, Low temperature research), (*Fracture (Mechanics), Titanium alloys), (*Toughness, Titanium alloys), Aluminum alloys, Vanadium alloys, Tin alloys, Heat treatment, Tensile properties, Shock resistance, Microstructure, Mechanical properties

The mechanical properties of Ti-6Al-6V-2Sn have been evaluated in the temperature range from +200 to -269C. A commercial and an extra-low interstitial (ELI) grade of the alloy were studied in both the as-received and heattreated conditions. The ELI grade was heat treated to two different microstructures each havine a yield strength level from 170 to 180 ksi. The data show that fatigue cracks severely reduced the notch strength and resulted in lower K sub Ic values than when sharply machinenotched. The material treated at the higher solution temperature exhibited higher K sub Ic values than that heat treated at the lower solution temperature, despite the higher alpha-beta ratio of the latter condition. (Author)

AD-620 746 Div. 17/4 ,17/2
CFSTI Prices: HC $1.00 MF $0.50
ARMY MATERIALS RESEARCH AGENCY WATERTOWN MASS
EFFECT OF MICROSTRUCTURE AND COOLING RATE ON THE MECHANICAL PROPERTIES OF TI-6AL-6V-2SN.
Technical rept.,
by Charles F. Hickey Jr.. 0 Jul 65, 18p. Rept. no. AMRA-TR-65-16
Proj. DA 1C024401A110
Unclassified report

Presented at the Annual Meeting of American Society for Testing and Materials at Purdue Univ., Lafayette, Ind., 17 Jun 65.

Descriptors: (*Titanium alloys, Mechanical properties), Aluminum alloys, Vanadium alloys, Tin alloys, Microstructure, Cooling, Heat treatment, Hot working, Martensite, Ductility, Shock resistance

The investigation concerns the separate effects of microstructure and cooling rate on the mechanical properties of the titanium alloy 6Al-6V-2Sn. Microstructure was varied by forging a 6-inch-diameter bar to diameters of 4-, 2-, and 5/8-inch. Each bar was then tested in both the annealed and heat-treated conditions. The effect of cooling rate alone was obtained by trepanning sections of 4-, 2-, and 5/8-inch diameter from the 6-inch-diameter bar, heat treating and testing. Mechanical property data were obtained utilizing tensile and impact specimens which were machined from the bar or section diameters following the final treatment phase. Photomicrographs are shown for a typical area of each conditions. Results of the investigation show that working tends to refine the overall microstructure, whereas cooling rate is a determining factor on the structure of the matrix but has little or no effect on the primary alpha size. Both microstructure and cooling rate strongly influence the resultant mechanical properties of this alloy. Primary microstructure is the major contributing factor on ductility and impact while both primary microstructure and cooling rate influence the final strength properties. (Author)

AD-620 773 Div. 17/5 ,26/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
MARTENSITE CONVERSION IN ALLOYS WITH AGING MARTENSITE,
by A. P. Gulayev, and N. I. Karchevskaya. 13 Aug 65, 9p. Rept. no. FTD-TT-65-670
TT , 65-63830
Unclassified report

Unedited rough draft trans. of Metallovedenie i Termicheskaya Obrabotka Metallov (USSR) n11 p2-5 1964.

Descriptors: (*Iron alloys, Martensite), (*Heat treatment, Iron alloys), (*Martensite, Heat treatment), Nickel alloys, Carbon alloys, Molybdenum alloys, Cobalt alloys, Titanium alloys, Aging (Materials), Hardness

Molybdenum reduces, and cobalt increases the martensite interval in alloys Fe plus 20% Ni. The investigated alloying elements affect the martensite interval in the system Fe - 20% Ni in the same way as in steel. Since before the aging the alloys should have a martensite structure (aging effect is due to processes taking place in alpha-phase), then the content of molybdenum, sharply decreasing the martensite point should be limited to 3% (if no cold treatment is used). In the presence of cobaltelement increasing martensite points, the content of molybdenum can be increased to 5%. The positive role of cobalt in alloys of this type apparently lies in the fact, that the addition of cobalt allows one to increase the content of molybdenum in the alloys. Hardness of annealed (not aged) alloy does not depend upon the ratio of austenite and martensite. Evidently, hardness of carbonless unaged martensite practically coincides with the hardness of the initial austenite. In the investigated alloys hardness cannot serve as a criterion of the degree of hardening. (Author)

AD-620 789 See Fld. 14/2

11/7. MISCELLANEOUS MATERIALS

AD-620 113 Div. 14/6 ,31/4
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
DIFFUSION RATES OF METHYL CHLOROFORM THROUGH SOME INSULATION MATERIALS.
Final rept.,
by F. E. Saalfeld, and M. V. McDowell. 28 Jul 65, 14p. Rept. no. NRL-6302
Proj. RR001 01 43 4804
Unclassified report

Descriptors: (*Chloroform, Diffusion), (*Thermal insulation, Permeability), (*Diffusion, Chloroform), Rubber adhesives, Submarines, Mass spectroscopy

Diffusion rates of methyl chloroform through insulation and decorative materials cemented to aluminum surfaces with Bondmaster No. 596 neoprene contact adhesive have been studied; in addition, the permeability coefficients for Ensolite and surface-covered corkboard to the abovementioned chlorinated hydrocarbon were measured. Rate-ofdiffusion measurements indicate that methyl chloroform is trapped behind surface-covered corkboard for a longer time (> 6 months) and emanates from the corkboard surface at a slower rate than for any other insulation material studied. One-inch Ensolite retains methyl chloroform longer than corkboard whose surface has not been covered or 1/2-in. Ensolite. Of the materials studied, the one with the greatest diffusion rate of methyl chloroform was uncovered corkboard. Methyl chloroform did not diffuse through the decorative laminate materials. On the basis of the data presented, a change of the corkboard cementing procedures in submarines has been recommended. Corkboard should be installed before being coated, and 1/2-in. Ensolite should replace the 1-in. material where possible. (Author)

AD-620 153 Div. 14/6 ,4/2 ,4/3
CFSTI Prices: HC $0.50 MF $0.50
COATING AND CHEMICAL LAB ABERDEEN PROVING GROUND MD
SPECTROPHOTOMETRIC DETERMINATION OF NITRITE ESTERS AND SALTS IN COOLANT MEDIA.
Final rept.,
by Jules B. Counts. 9 Aug 65, 16p. Rept. no. CCL-184
Proj. DA-1C024401A109
Unclassified report

Descriptors: (*Freezing point depressants, Antioxidants), (*Antioxidants, Nitrites), (*Nitrites, Determination), Cerium compounds, Esters, Salts, Absorption spectrum, Colorimetric analysis, Quantitative analysis, Spectra (Visible + ultraviolet)

The method is based on the reduction of yellow ceric salts by nitrites, and the subsequent loss of color is employed as a means of estimating the percentage of nitrite. The absorption of visible light at 400 millimicrons by the reduced ceric solution is chosen as the wavelength for quantitative colorimetric measurements. After removal of dye this wavelength is free of interference from other antifreeze consituents normally found in current antifreeze compounds. (Author)

AD-620 170 Div. 14/6
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
THE EFFECTS OF A JET FUEL ANTI-ICING ADDITIVE ON FUEL TANK LININGS.
Interim rept.,
by G. E. Rohl, and J. E. Cowling. 19 Jul 65, 11p. Rept. no. NRL-6276
Proj. Y-F015-01-001
Unclassified report

Descriptors: (*Jet engine fuels, Ice prevention), (*Ice prevention, Jet engine fuels), Fuel additives, Storage tanks, Fuel tanks, Tank liners, Water, Glycols, Ethers, Aliphatic compounds

The Navy currently is studying the possibility of incorporating an anti-icing additive (AIA) consisting mainly of methyl cellosolve in its jet fuels. A question has arisen as to the effect this additive might have on organic linings now generally used in fuel storage tanks. Test panels coated with the various approved lining materials were immersed for 12 months in a waterfuel mixture containing this anti-icing additive in progressively increasing amounts, ranging from 0 to 100% in the aqueous phase. Results at the end of 12 months indicate that there is significantly less blister formation, both in size and density, of linings exposed to 20 to 40% concentrations of anti-icing additive than of linings exposed to higher and lower concentrations. The concentration limits which the additive would reach in water in normal service are in the 20 to 40% range. (Author)

AD-620 391 Div. 14/6
CFSTI Prices: HC $4.00 MF $0.75
TEXAS UNIV AUSTIN
COMPRESSIVE AND TENSILE STRENGTH CHARACTERISTICS OF MASONRY MORTARS.
Master's thesis,
by Paul G. Wachter. 0 Aug 65, 123p. Contract AF33 608 1121
Unclassified report

Original document contains color other than black and white and is available in limited supply. After present stock is exhausted, it will be available in black and white only.

Descriptors: (*Cements, Mechanical properties), Compressive properties, Tensile properties, Aging (Materials), Moisture, Structural properties

The investigation presented was a study of the nature of strength relationships to mortar mixtures of varying water-cement ratios. Moist curing of the mortar specimens significantly increased their ultimate compressive and tensile strengths. Moist curing of the mortar specimens produced a higher percentage increase in the compressive strength of the mortar cubes than percentage increase in the tensile strength in the mortar cylinders. The tensile strength of the moist cured mortars was approximately 10% of the compressive strength. Tensile strength can also be stated to be 7.0 square root of F sub mc for the moist cured specimens. Both compressive and tensile ultimate strengths take a sharp decrease if the watercement ratio of a mortar mixture is increased from 0.4 to 1.0. This would present a critical area for watercement ratio control. In order to obtain high compressive and tensile strengths in mortars, low water-cement ratios are needed and from the standpoint of economy and efficiency, it may prove advantageous to establish some type of mortar mixture control during field preparation of mortar mixtures. In addition, the photoelastic analysis of the diametral compression load test of the mortar cylinder specimens proved to yield very satisfactory qualitative results and to a lesser degree quantitative results.

AD-620 428 Div. 14/6
CFSTI Prices: HC $4.00 MF $0.75
PITTSBURGH UNIV PA
A STUDY OF NO-SLUMP CONCRETE.
Master's thesis,
by Gary Stamler Flora. 01965, 122p. Contract AF33 608 1104

Unclassified report

Descriptors: (*Concrete, Structural properties), Mixtures, Compressive properties, Porosity, Fracture (Mechanics), Additives, Experimental data

A study was made of no-slump concrete, with primary consideration given to the effects of type of cement, use of admixtures, and shape of coarse aggregate on the properties of fresh and hardened concrete. The properties of fresh concrete that were observed included slump, workability, and air content. The properties of primary interest for hardened concrete were flexural strength and compressive strength. All of the mixes were designed to fall within the limits of zero to one inch of slump, and this was accomplished. The slump test is often used as the standard for the measure of the consistency of concrete. However, it was shown here that in the no-slump range this device was inadequate for measuring consistency. A variety of water/cement ratios from 3.9 gallons per sack to 5.0 gallons per sack with a constant cement factor failed to produce a change in slump. In higher slump mixes, additional water in a given situation produces a change in slump.

AD-620 551 Div. 14/6 ,14/8 ,7/2
CFSTI Prices: HC $2.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
THE LOSS FACTOR OF FORMVAR.
Interim rept.,
by Thomas D. Callinan. 5 Apr 48, 26p. Rept. no. NRL-3275

Unclassified report

Previously announced 9 May 51 as PB-103 030, LC mi $2.00, ph $3.75.

Descriptors: (*Thermoplastics, Dielectric properties), (*Electric insulation, Thermoplastics), (*Acetal plastics, Electric insulation), Electric insulation, Power, Complex variables, Energy

The loss factor of a dielectric is shown to be applicable to four discrete concepts of phenomena, viz. (1) the measure of the power loss in the dielectric, (2) a component of a complex dielectric constant, (3) the effect arising from mixtures of materials with different time constants, (4) a measure of activation in energy. Each of these is studied in turn and the relationships applied to Formvar insulation. (Author)

AD-620 579 Div. 14/6 ,4/3 ,16/4
CFSTI Prices: HC $2.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
VOLATILE COMPOUNDS AS FUNGICIDES,
by Walter L. Clark, and John M. Leonard. 0 Jul 47, 32p. Rept. no. NRL-3114

Unclassified report

Previously announced Apr 60 as PB-129 158, LC mi $3.00, ph $6.30.

Descriptors: (*Fungicides, Vapors), Organic compounds, Selection, Phosphites, Formaldehyde, Compatibility, Metals, Plastics, Degradation, Corrosion, Hydrocarbons, Halogenated Hydrocarbons, Aldehydes, Ketones

The vapors of approximately 250 organic compounds were examined for fungus inhibitive properties. The procedure was a petri-dish assay, which, though scarcely comparable to actual tests under service conditions, does afford a rapid and convenient method of screening. Some of the more promising compounds were scrutinized for secondary degradative effects, vis., corrosion of metals and impairment of plastics. A number of promising compounds were disclosed, among them tricresyl phosphite and trioxy-methylene. (Author)

AD-620 582 Div. 14/6 ,14/8 ,7/2 ,30/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
THERMAL EVALUATION OF FORMVAR RESIN,
by Thomas D. Callinan. 30 Oct 47, 18p. Rept. no. NRL-3191 2

Unclassified report

Previously announced 16 May 51 as PB-103 101, LC mi$1.75, ph$2.50.

Descriptors: (*Electric insulation, Thermoplastics), (*Test methods, Electric insulation), (*Acetal plastics, Electric insulation), Nondestructive testing, Life expectancy, Electrical properties, Dielectric properties, Temperature, Aging (Materials), Thermal properties, Acetal plastics

The purpose of this work was to develop a method of evaluating electrical insulating materials with the end in view of being able to predict the life of an insulation when operated at a given temperature. The method described involves the determination of the electrical properties of Formvar Resin at various temperatures after aging under special conditions. Numerous plots of data are given to illustrate the changes in electrical properties which Formvar Resin undergoes with time. (Author)

11/8. OILS, LUBRICANTS, AND HYDRAULIC FLUIDS

AD-620 158 Div. 14/5 ,30/5 ,26/1
CFSTI Prices: HC $2.00 MF $0.50
ARMY WEAPONS COMMAND ROCK ISLAND ILL RESEARCH AND ENGINEERING DIV
PERFORMANCE EVALUATION OF CUTTING FLUIDS.
Technical rept.,
by Lanny D. Wells. 0 Jun 65, 30p. Rept. no. 65-1491
Proj. PEMA-56209

Unclassified report

Descriptors: (*Cutting fluids, Performance (Engineering)), Cutting tools, Life expectancy, Velocity, Test methods, Costs

An investigation into the effects of cutting fluids upon tool life, cutting forces and various theoretical tool-chip relationships has been conducted for the purpose of developing a test procedure for cutting fluid performance evaluation. Variable speed tool life testing under carefully controlled conditions, with complete tool failure as the end point of tool life, was found to give the most satisfactory results. Some correlation was found to exist between tool life and the Falex extreme pressure test and some theoretical relationships. This correlation appears to be of academic interest only and is of little practical value because of the inherent variation in most machining operations. (Author)

AD-620 164 Div. 14/3 ,14/5
CFSTI Prices: HC $1.00 MF $0.50
OLIN MATHIESON CHEMICAL CORP NEW HAVEN CONN CHEMICALS DIV
NONFLAMMABLE HYDRAULIC FLUIDS AND LUBRICANTS: BIS- (M-CHLOROPHENOXY TRIFLUOROETHOXY) PHOSPHONITRILE,
by E. D. Blackwell. 30 Aug 65, 2p. Contract NObs92311

Unclassified report

Descriptors: (*Organic phosphorus compounds, Physical properties), (*Hydraulic fluids, Physical properties), (*Lubricants, Physical properties), Hydrolysis, Flammability, Stability, Halogenated hydrocarbons, Nitriles, Ethers

A listing is given of the physical properties of 80/20 trimer/tetramer bis (m-chlorophenoxy trifluoroethoxy) phosphonitrile, a hydrolytically stable material prepared in accordance with a procedure described in AD-608 144.

AD-620 214 **See Fld. 11/6**

AD-620 294 Div. 14/5 ,30/5 ,27/2
CFSTI Prices: HC $2.00 MF $0.50
AIR FORCE AERO PROPULSION LAB AIR FORCE SYSTEMS COMMAND WRIGHT-PATTERSON AFB OHIO
LOAD-CARRYING CAPACITIES OF GEAR LUBRICANTS OF DIFFERENT CHEMICAL CLASSES BASED ON RESULTS OBTAINED WITH WADD HIGH-TEMPERATURE GEAR MACHINE USED WITH INDUCTION-HEATED TEST GEARS.
Technical rept.,
by G. A. Beane,IV, AND C. W. Lawler. 0 Apr 65, 46p. Rept. no. APL-TR-65-23
Proj. 3044 ,648D Task 304401

Unclassified report

Prepared in cooperation with Southwest Research Inst., San Antonio, Tex., Contracts AF33 (616)7223, AF33 (657)9248, and AF33 (657)11028.

Descriptors: (*Lubricants, Gears), (*Loading (Mechanics), Lubricants), (*Gears, Lubricants), Lubrication Heatresistant materials, Test equipment

The WADD High-Temperature Gear Machine and its operation are described briefly. The procedures used with the machine are shown to provide a realistic means of evaluating and screening lubricants for use in aircraft turbine engines operating at elevated gear and lubricant temperatures. A cross section of oils representing different chemical classes of lubricants was used with the WADD High-Temperature Gear Machine in conjunction with induction-heated test gears. The influence of gear material on load-carrying capacity of gears was studied by using two different steel compositions. Also, the effect of gear temperature on load-carrying capacity was investigated at temperatures up to 700F. The data generated on the WADD High-Temperature Gear Machine, when compared with that generated on the Erdco Ryder

Gear Machine, indicated that the rates obtained were comparable. When using Standard Ryder gears (AMS 6260) and gears made of a high-temperature gear material (Nitralloy-N Steel), the load-carrying capacity of a lubricant could not be predicted adequately by using as test gears those composed of an alloy that would be used for the intended application. All of the lubricants evaluated when Nitralloy-N steel test gears were used demonstrated a decrease in load-carrying capacity with increasing gear temperature up to about 400F. (Author)

11/9. PLASTICS

AD-620 126 See Fld. 7/3

AD-620 142 Div. 14/8
CFSTI Prices: HC $2.50 MF $0.75
PLASTICS TECHNICAL EVALUATION CENTER PICATINNY ARSENAL DOVER N J
SUBJECT INDEX, BIBLIOGRAPHY, AND CODE DESCRIPTION OF TECHNICAL CONFERENCE PAPERS ON PLASTICS: 2 MARCH 1964-5 MARCH 1965,
by Joan B. Titus, and Arnold E. Molzon. 0 Jun 65, 109p. Rept. no. PLASTEC-21
Unclassified report

See also AD-423 560.

Descriptors: (*Plastics, Reports), (*Documentation, Plastics), Subject indexing, Bibliographies, Symposia, Coding, Indexes

The papers presented at technical conferences on plastic materials and related technology, within a one year period ending 5 March 1965 have been listed, indexed by subject, and compile by material, type of technical data, and military application. Over 550 papers from 23 conferences have been covered. Included are a bibliography, author index, summary of new material developments, and a list of applications and programs sponsored by the Department of Defense and the National Aeronautics and Space Administration.

AD-620 154 Div. 14/8 ,4/3
CFSTI Prices: HC $0.50 MF $0.50
COATING AND CHEMICAL LAB ABERDEEN PROVING GROUND MD
DETERMINATION OF ISOPHTHALIC ACID IN ALKYDNITROCELLULOSE LACQUERS.
Final rept.,
by James R. Keiser. 6 Aug 65, 15p. Rept. no. CCL-183
Proj. DA-1C024401A329
Unclassified report

Descriptors: (*Phthalic acids, Infrared spectroscopy), (*Nitrocellulose, Infrared spectroscopy), (*Varnishes, Cellulosic plastics), Determination, Polyester plastics, Absorption spectrum, Plasticizers

A previous report (M. L. Adams. An abbreviation of a quantitative infra-red method for nitrocellulose and its application to alkyd-nitrocellulose lacquers. CCL rept. no. 154, AD-432 592) outlines an infrared absorption technique for the measurement of nitrocellulose in lacquers. The present report utilizes this value for the nitrocellulose content in proposing an infrared absorbance ratio method for the measurement of isophthalic acid present in these lacquers. The determination is carried out on solvent-free films of isolated vehicles and compares the ratio of isophthalic acid to nitrocellulose. (Author)

AD-620 214 See Fld. 11/6

AD-620 355 See Fld. 11/3

AD-620 544 See Fld. 7/3

AD-620 551 See Fld. 11/7

AD-620 572 See Fld. 18/8

AD-620 573 See Fld. 18/8

AD-620 582 See Fld. 11/7

AD-620 734 Div. 14/8 ,4/4
CFSTI Prices: HC $3.00 MF $0.75
AMERICAN CYANAMID CO STAMFORD CONN
THE RELATIONSHIPS BETWEEN POLYMERS AND GLASS TRANSITION TEMPERATURES.
Final summary rept. for Jun 63-May 65,
by O. G. Lewis, and L. V. Gallacher. 0 Jul 65, 84p. Contract AF33 657 11224 Proj. 7342 Task 734203
ML , TR-65-231
Unclassified report

Descriptors: (*Aliphatic compounds, Transition temperature), (*Polymers, Transition temperature), Plastics, Heat of activation, Thermodynamics, Relaxation time, Viscosity, Liquids, Mathematical analysis, Glass

A study of some empirical and theoretical functions for the effect of temperature on liquid viscosity indicated that the viscosities of the n-alkanes are well represented by the equation log (eta/d) = log (A/T) + B/ (T-T sub o), where d is the density and A, B and T sub o are smooth functions of chain length. The effect of increasing static pressure is to increase A and T sub o, while B is only slightly affected. A diagrammatic method for evaluating steric effects in polymer chains was developed. Some excluded volume effects in rings and short chains of the -CX2- type are elucidated in this way. An empirical approach to estimation of flex energy and hence T sub o is suggested. A statistical-mechanical theory of the glass transition was developed, based on the concept that the observable communal entropy is time dependent. The activation free energy, enthalpy and entropy at the glass temperature were evaluated for several polymers. Intermolecular interactions in liquid alkanes were studied, and an additive property Q = (BpV)0.7240 was found, where Bp is the Antoine vapor pressure constant, and V the molar volume. Q is dependent on the number of C atoms, the number of side branches, and the number of pairs of vicinal branches.

AD-620 754 Div. 14/8
BATTELLE MEMORIAL INST COLUMBUS OHIO
HOW STRUCTURE DETERMINES PROPERTIES OF PLASTICS,
by R. M. Kell, and P. B. Stickney. 01964, 4p.
Unclassified report

Pub. in Materials in Design Engineering May 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Plastics, Structural properties), Physical properties, Mechanical properties, Polymers, Crystal structure, Brittleness, Transition temperature, Molecular structure, Reviews

A semi-technical discussion is given which includes the following topics: the nature of monomers and polymers; the formation of polymers; primary and secondary bonding in plastics; control of polymer geometry; effects of crystallinity on properties; relationship of brittleness.

AD-620 766 See Fld. 13/8

AD-620 771 Div. 14/8 ,14/9 ,4/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
ON THE USE OF BORIC ACID ESTERS IN ROLE OF ANTIOXIDANTS FOR POLYMERIC MATERIALS,
by E. I. Rozantsev, L. A. Krinitskaya, and L. S. Troitskaya. 20 Aug 65, 11p. Rept. no. FTD-TT-65-703
TT , 65-63828
Unclassified report

Unedited rough draft trans. of Khimicheskaya Promyshlennost (USSR) n3 p20-23 1964. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Polymers, Antioxidants), (*Antioxidants, Borates), (*Borates, Antioxidants), Phenols, Organic sulfur compounds, Synthesis (Chemistry), Spectra (Visible + ultraviolet), Oxidation, Reaction kinetics, Thermal properties, Organoboranes, Polyethylene plastics, Additives, USSR

Several phenyl borates of aromatic diols and thiols were synthesized and their ability to impart stability to thermo-oxidation in polypropylene was studied.

AD-620 792 Div. 14/8
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
METHOD OF MODIFYING THE SURFACES OF FILMS OF POLYTETRAFLUORO ETHYLENE AND POLYTRIFLUOROCHLORO ETHYLENE,
by V. V. Korshak, K. K. Mozgova, and T. M. Babchinister. 25 Aug 65, 6p. Rept. no. FTD-TT-65-496
TT , 65-63844
Unclassified report

Unedited rough draft trans. of Russian Patent 158 063, pub. 27 Apr 62, appl. no. 776293/23-4.

Descriptors: (*Halocarbon plastics, Surface properties), Films, Vinyl plastics, Tensile properties, Adhesion, Patents, USSR

The object of invention is a method of modifying surface of polytetrafluoroethylene and polytrifluorochloro ethylene films by grafting to them polymers of the vinyl series. For the purpose of simplifying the process, monomers with films placed in them are heated in a medium of inert gas at 60-130C for a period of 4-8 hours. (Author)

11/10. RUBBERS

AD-620 214 See Fld. 11/6

AD-620 355 See Fld. 11/3

AD-620 546 Div. 14/9 ,4/3
CFSTI Prices: HC $1.00 MF $0.50
REACTION MOTORS DIV THIOKOL CHEMICAL CORP DENVILLE N J
CARBORANE-SILOXANE ELASTOMERS.
Rept. for 19 May-18 Aug 65,
by Joseph Green. 18 Aug 65, 22p. Rept. no. RMD-5065-Q2
Contract DA11 070AMC852W
Unclassified report

Descriptors: (*Organoboranes, Elastomers), (*Siloxane, Elastomers), Synthesis (Chemistry), Polymerization, Polymers, Heat-resistant plastics

Investigation of carborane-siloxane polymer synthesis was continued. Polymeric products with the structure O- (Si (CH3)2 (CH2)3CB10H10C (CH2)3Si (CH3)2)- were prepared by silylalkoxysilylhalide condensation polymerization, hydrolysis condensation polymerization of silylhalides, and by ring-opening polymerization of a cyclosiloxane. Thermal stability of carborane-siloxane polymers was determined by thermogravimetry and molecular weight changes in heat treated materials. (Author)

AD-620 562 Div. 14/9 ,4/3
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
SOME ALDEHYDEAMINE ACCELERATORS.
Interim rept.,
by Juan C. Montermoso. 14 Mar 49, 23p. Rept. no. NRL-3300
Unclassified report

Previously announced 5 Aug 53 as PB-111 156. LC mi $2.25 ph $4.00.

Descriptors: (*Vulcanization, Catalysis), (*Catalysis, Vulcanization), Aldehydes, Amines, Rubber, Molecular properties, Mechanical properties, Tensile properties, Synthesis (Chemistry), Organic sulfur compounds, Hardness, Sulfur

As part of the search for better accelerators for rubber vulcanization, a study is undertaken of some aldehydeamines with the purpose of correlating molecular structure with the physical properties imparted to the product. Six compounds synthesized for the study were evaluated in comparison with mercaptobenzothiazole (Captax) and the heptaldehydeaniline condensation product (Hepteen Base) with regard to tensile strength, tensile stress at 500% elongation, ultimate elongation, oven aging, oxygenbomb aging, compression set, free sulfur, and hardness. None possessed the oxygen-resistant property of Captax. In the presence of an antioxidant however, N,N' -dibenzylidene ethylene diamine compared favorably with standard accelerators. It was found to act efficiently alone, as well as in various combinations with one or more of the compounds, Captax, benzothiazyl disulfide (Altax), and zinc dimethyl dithiocarbamate (Methyl Zimate). (Author)

AD-620 694 Div. 14/9
CFSTI Prices: HC $3.00 MF $0.50
ARMY NATICK LABS MASS
SILICA-REINFORCED ETHYLENE-PROPYLENE DIENE (EPD) RUBBERS.
Technical rept.,
by Peter Dunn, and Vincent S. Javier. 0 Aug 65, 55p. Rept. no. C and OM-7
Proj. 50305101
Unclassified report

Descriptors: (*Synthetic rubber, Reinforcing materials), (*Elastomers, Reinforcing materials), (*Silicon compounds, Synthetic rubber), Polyethylene plastics, Additives, Dioxides, Vulcanizates, Aging (Materials), Processing, Plasticizers, Stearates, Carbon black, Clay, Environmental tests

High quality ethylene-propylene diene (EPD) rubber vulcanizates can be produced by using hydrated silica as the reinforcing filler. Modification of EPD rubber by chemical promotors such as p-quinone dioxime and the use of silica activators such as polyethylene glycol gives compounds with an acceptable rate of cure. Hot mastication, especially in the presence of halogenated compounds, gives vulcanizates with good physical properties. Processing aids such as stearic acid may be used, and oilextended EPD rubber is a convenient plasticizer for silicareinforced compounds. To reduce costs, silica fillers can be extended with other such low-cost fillers as hard clay. EPD rubbers may also be blended with other elastomers. High quality silica-reinforced expanded EPD rubbers may be produced by conventional blowing agents and processing techniques. Silica-reinforced EPD rubbers crosslinked with organic peroxides give vulcanizates with good resistance to abrasion and compression set. EPD rubber vulcanizates have excellent resistance to ozone and fungi and, in the presence of ultraviolet screening agents, show good weathering properties. (Author)

AD-620 764 Div. 14/9
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
METHOD OF REINFORCING RUBBER,
by L. V. Kosmodemyanskii, and E. G. Lazaryants. 25 Aug 65, 5p. Rept. no. FTD-TT-65-501 TT , 65-63821
Unclassified report

Unedited rough draft trans. of Russian Patent 166 132, pub. 13 Apr 62, appl. no. 773821/23-4.

Descriptors: (*Rubber, Additives), Heat-resistant materials, Reinforcing materials, Styrene plastics, Vulcanizates, Patents, USSR

The object of the invention is a method of reinforcing rubber with synthetic resins, characterized by the fact, that for the purpose of increasing the heat resistance of vulcanizates, dimethylbutadienestyrene resens are used. (Author)

AD-620 771 See Fld. 11/9

12/1. MATHEMATICS AND STATISTICS

AD-620 102 Div. 15/1
CFSTI Prices: HC $1.00 MF $0.50
MATHEMATICS RESEARCH CENTER UNIV OF WISCONSIN MADISON
ARCS AND CHORDS, II.
Technical summary rept.,
by A. S. Besicovitch. 0 Jul 65, 16p. Rept. no. MRC-TSR-564
Contract DA11 022ORD2059
Unclassified report

Descriptors: (*Measure theory, Set theory), Geometry, Functional analysis

The simple arcs of Hausdorff dimension h> 1 are studied from the point of view of the limits of the ratio: (lambda to the hth power) J (v,v')/absolute value (v-v') to the hth power, as v' approaches v, where J (v, v') is the arc between v and v'. The bounds of various densities at points of arcs are given. It is shown that in all cases but one the bounds are exact. (Author)

AD-620 103 See Fld. 20/12

AD-620 104 See Fld. 20/12

AD-620 105 See Fld. 20/4

AD-620 106 Div. 15/1
CFSTI Prices: HC $1.00 MF $0.50
MATHEMATICS RESEARCH CENTER UNIV OF WISCONSIN MADISON
ON MONOSPLINES OF LEAST DEVIATION AND BEST QUADRATURE FORMULAE II.
Technical summary rept.,
by I. J. Schoenberg. 0 May 65, 17p. Rept. no. MRC-TSR-569
Contract DA11 022ORD2059
Unclassified report

Descriptors: (*Least squares method, Polynomials), Numerical analysis, Functions, Integration

A new method of constructing best quadrature formulae is established in the form of a generalization of Rodrigues' formula for Legendre polynomials. (Author)

AD-620 107 Div. 15/1
CFSTI Prices: HC $3.00 MF $0.50
MATHEMATICS RESEARCH CENTER UNIV OF WISCONSIN MADISON
ON THE CONVERGENCE AND STABILITY OF THE EPSILON ALGORITHM.
Technical summary rept.,
by P. Wynn. 0 Jun 65, 57p. Rept. no. MRC-TSR-572
Contract DA11 022ORD2059
Unclassified report

Descriptors: (*Sequences, Transformations (Mathematics)), Stability, Series, Polynomials, Determinants

The epsilon-algorithm is a sequence-to-sequence convergence accelerating transformation. Using the theory of totally monotone sequences, qualitative assertions concerning the nature of the derived sequences are made. Asymptotic estimates for the members of the derived sequences are given for the cases in which the members of the original sequence can asymptotically be represented by means of Newton series or by Dirichlet series. A stability analysis of the epsilon-algorithm is carried out, and a short description of the smoothing effect of this algorithm is provided. (Author)

AD-620 108 See Fld. 20/4

AD-620 109 Div. 15/1
CFSTI Prices: HC $2.00 MF $0.50
MATHEMATICS RESEARCH CENTER UNIV OF WISCONSIN MADISON
ON THE DISTRIBUTION OF EIGENVALUES FOR AN NTH-ORDER EQUATION.
Technical summary rept.,
by J. B. McLeod. 0 Jun 65, 39p. Rept. no. MRC-TSR-576
Contract DA11 022ORD2059
Unclassified report

Descriptors: (*Differential equations, Distribution theory), Functional analysis

The asymptotic behavior is discussed of the eigenvalues associated with a 2 nth order differential equation, (X < or = 0) and n homogeneous linear boundary conditions at x = 0. Work of Turrittin is used on the Stokes multipliers for asymptotic solutions of the differential equation. At the same time, it is shown how, at least in the case n = 2, this detailed work can be avoided, giving hope for extending these results to more general differential equations.

AD-620 110 Div. 15/1
CFSTI Prices: HC $2.00 MF $0.50
MATHEMATICS RESEARCH CENTER UNIV OF WISCONSIN MADISON
PARTITIONING AND TEARING SYSTEMS OF EQUATIONS.
Technical summary rept.,
by Donald V. Steward. 0 Jun 65, 36p. Rept. no. MRC-TSR-581
Contract DA11 022ORD2059
Unclassified report

Descriptors: (*Simultaneous equations, Sequential analysis), Numerical methods and procedures, Matrix algebra

Partitioning refers to partitioning systems of equations, linear or non-linear, into subsets of equations, i.e., blocks, such that the blocks can be solved one at a time sequentially, but that the equations within a block must be solved simultaneously. Tearing refers to identifying dependencies, i.e., the appearance of certain variables in certain equations, such that by special handling of these dependencies blocks can be partitioned into yet smaller blocks. Algorithms for partitioning and tearing are given. (Author)

AD-620 149 See Fld. 18/9

AD-620 162 Div. 15/1
CFSTI Prices: HC $3.00 MF $0.75
WASHINGTON UNIV SEATTLE DEPT OF MATHEMATICS
A GENERALIZATION OF THE CARTAN-KAHLER THEOREM.
Technical rept.,
by Lafry E. Mansfield. 0 Aug 65, 70p. Rept. no. TR-27
Contract Nonr47715 Proj. NR-043 186
Unclassified report

Descriptors: (*Differential equations, Algebraic geometry), Surfaces, Geometry, Integrals, Partial differential equations, Theorems

An existence theorem for hyperbolic systems of partial differential equations is used to obtain a generalization of the Cartan-Kahler theorem to non-analytic differential systems. In order to apply this theorem certain restrictions must be placed on the differential system considered. A C (k)-differential system S in r independent variables satisfying these conditions is said to be C (k)hyperbolic in the x (r)-direction. After making this definition the following theorem is proved. Let S be C (k)hyperbolic in the x (r)-direction with k>or=4 (r+1) and genus g > or = r. Suppose I sub (r-1) is an (r-1)-dimensional C (k)-integral submanifold of S. Then in a neighborhood of each regular point p contained in I sub (r-1) of S there exists an r-dimensional C (k)-integral submanifold containing I sub (r-1). In case r = 2 the differential system need only be C (1) for the theorem to hold. The concept of a moving frame is introduced and used to set up four applications of the above theorem to problems in surface theory. In the section on applications it is proved that locally a 2-dimensional C (k)-Riemannian manifold has a C (k)-isometric imbedding in 3-dimensional euclidean space for k > or = 1. It is shown that the theorem cannot be used to obtain a local C (k)-conformal equivalence between two surfaces. (Author)

AD-620 172 **See Fld. 5/1**

AD-620 174 Div. 15/1 ,30/1
CFSTI Prices: HC $2.00 MF $0.50
CARNEGIE INST OF TECH PITTSBURGH PA GRADUATE SCHOOL OF INDUSTRIAL ADMINISTRATION
A METHOD FOR SCHEDULING STUDENTS TC CLASSES.
Management sciences research rept.,
by Gerald L. Thompson. 0 Jul 65, 28p. Rept. no. MSRR-46
Contract Nonr76024 Proj. NR-047-048
Unclassified report

Descriptors: (*Scheduling, Students), (*Students, Scheduling), Game theory, Linear programming, Optimization, Programming (Computers), Decision theory

In the paper the author proposed a method for programming an electronic computer to provide a solution for a medium sized university to the classroom scheduling problem with the following features: (1) Given (a) a list of available courses, sections, times and maximum enrollments, and (b) for each student a list of the courses he would like to take together with 2 or 3 hours during the week at which he would like to be free, the program produces schedules for each student, and an over-all schedule for the whole university that keeps within the prescribed bounds (providing such a feasible schedule exists.) (2) At the heart of the method is a streamlined version of the 'stopped simplex method' for solving integer programming problems. (3) The resulting schedule is not necessarily optimal relative to any objective function. However, several heuristic rules are built into the code which give it high probability of finding a schedule that is optimal or nearly optimal relative to the objective function proposed in the model. (4) The computer time (IBM 7090 or equivalent machine) required to schedule all the students in a university having 15,000 to 20,000 students is estimated to be 2 or 3 24hour days, i.e., a long weekend. Hence the method is practical on a real-time basis. (Author)

AD-620 176 Div. 15/1
CFSTI Prices: HC $2.00 MF $0.50
CARNEGIE INST OF TECH PITTSBURGH PA GRADUATE SCHOOL OF INDUSTRIAL ADMINISTRATION
AN EXTENSION OF THE BOUND ESCALATION METHOD FOR INTEGER PROGRAMMING: A PSEUDO PRIMAL-DUAL ALGORITHM OF THE GOMORY ALLINTEGER VARIETY.
Management sciences research rept.,
by Fred Glover. 0 Jul 65, 36p. Rept. no. MSRR-49
Contract Nonr76024 Proj. NR-047-048
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC.

Descriptors: (*Linear programming, Numbers), Mathematical programming

An extension of the bound escalation method is presented that enables the customary dual feasibility requirement in the integer programming tableau to be systematically violated and then restored. The bound escalation method itself is composed of two stages. In the first stage a structure called the bounding form is created by applying a series of nonsingular integer transformations to the problem matrix. The second stage then operates on the bounding form to obtain lower bounds for a subset of the current problem variables and thereby to advance the problem toward solution.

AD-620 186 **See Fld. 9/2**

AD-620 193 **See Fld. 20/4**

AD-620 216 Div. 15/1
CFSTI Prices: HC $2.00 MF $0.50
LOCKHEED MISSILES AND SPACE CO SUNNYVALE CALIF
A NON-LINEAR OPTIMUM STOCHASTIC CONTROL PROBLEM,
by Charlotte Striebel. 0 Aug 65, 31p. Rept. no. TR-6-75-65-47
Unclassified report

Descriptors: (*Optimization, Control), (*Dynamics, Control), Dynamic programming, Stochastic processes, Boundary value problems, Calculus of variations

Optimum control of a vector-valued dynamic system with white noise driving functions is considered. Observations are taken to be linear in the system vector and in the observation error process which is also a white noise. The convariance matrices of the white noise processes and the coefficients of the dynamic system and of the observation equation are all assumed to be known. The loss function is a linear combination of the square of a one-dimensional final miss distance and the integral over time of the absolute value of the control vector. The optimum control is to be determined as a function of all available observations. By attacking the discrete control problem (control is restricted to a finite number of previously specified times) it is shown that the optimum control is a function only of the 'best' estimate of the final miss and that control is to be applied in such a way that this estimate remains within a certain boundary. Thus, the optimum control problem is reduced to that of determining this boundary. For the discrete case, recursion equations are given by which the boundary can be computed. By formally passing to the continuous case, under certain regularity conditions it is shown that this boundary is the solution to a free boundary problem for the heat equation. (Author)

AD-620 225 Div. 15/1
MINNESOTA UNIV MINNEAPOLIS DEPT OF MATHEMATICS
PROCEEDINGS OF THE CONFERENCE ON COMPLEX ANALYSIS, MINNEAPOLIS 1964.
Final rept.,
by A. Aeppli, E. Calabi, and H. Rohrl. 01965, 320p. Contract AF AFOSR625 64 Proj. 9749 Task 974902
AFOSR , 65-1592
Unclassified report

Available from Springer-Verlag, Berlin, Heidelberg, New York.

Descriptors: (*Complex variables, Symposia), Algebraic topology, Polynomials, Conformal mapping, Groups (Mathematics), Algebras, Surfaces, Projective geometry

Papers are given that were presented at the Minnesota Conference on Complex Analysis. Topics covered include Stein manifolds, polynomial convexity, quasi-conformal mappings, Kleinian groups, uniform algebras, complex Lie groups, analytic spaces, holomorphic fiber bundles, point modifications, pseudogroup structures, linear topological spaces, Riemann surfaces, complex manifolds, holomorphic mappings, projective geometry, several complex variables, Siegel space, and Teichmuller spaces. In all 26 papers are reported. (Author)

AD-620 236 **See Fld. 9/2**

AD-620 237 **See Fld. 9/2**

AD-620 239 Div. 15/2
CATHOLIC UNIV OF AMERICA WASHINGTON D C DEPT OF MATHEMATICS
APPLICATIONS OF CHARACTERISTIC FUNCTIONS,
by E. Lukacs, and R. G. Laha. 01964, 204p. Contract AF AFOSR61 32 ,NSF G9968 Proj. 9749 Task 974902
AFOSR , 65-1591
Unclassified report

Available from Charles Griffin and Co. Ltd., 42 Drury Lane, London, England.

Descriptors: (*Statistical functions, Distribution theory), Probability, Statistical distributions, Stochastic processes, Population (Mathematics), Measure theory, Integral transforms, Matrix algebra

Applications of characteristic functions to problems of theoretical statistics are considered. Some multivariate distributions which occur in statistical problems are studied, and the distribution problem of statistics is solved in those cases where the integrals of the distribution function can be evaluated. Independent statistics are discussed and situations in which they determine the distribution functions of random variables, considered. Some regression problems, problems in the theory of stochastic processes, stability theorems, and identically distributed statistics are studied. Most theorems presented are given with detailed proofs. (Author)

AD-620 278 Div. 15/1
CFSTI Prices: HC $1.00 MF $0.50
STANFORD UNIV CALIF DEPT OF STATISTICS
THE DIVISION OF SPACE BY HYPERPLANES WITH APPLICATIONS TO GEOMETRICAL PROBABILITY.
Technical rept.,
by Thomas Cover, and Bradley Efron. 10 Aug 65, 19p. Rept. no. TR-108
Contract Nonr22552 Proj. NR342 022
Unclassified report

Descriptors: (*Geometry, Probability), Combinatorial analysis, Conical bodies, Algebraic topology, Measure theory

Invariant combinatorial properties are investigated of convex cones and their dual cones generated by collections of vectors in a Euclidean space. These properties, which include the number of non-degenerate cones, the number of k-faces of these cones, and the natural measures of the set of k-faces, do not depend on the configuration of the set of generating vectors, except for a weak non-degeneracy requirement. Applications to geometrical probability are given. (Author)

AD-620 288 Div. 15/2
CFSTI Prices: HC $2.00 MF $0.50
STANFORD UNIV CALIF DEPT OF STATISTICS
APPROXIMATIONS TO THE DISTRIBUTION

FUNCTION OF SUMS OF INDEPENDENT CHI RANDOM VARIABLES.
Technical rept.,
by Herman Rubin, and James Zidek. 3 Aug 65, 27p. Rept. no. TR-106
Contract Nonr22552 Proj. NR342 022
Unclassified report

Descriptors: (*Statistical functions, Distribution theory), Probability, Integrals, Differential equations, Taylor's series, Numerical methods and procedures

The problem is considered of approximating the distribution function, F sub n, where there are n independent standard normal random variables. Three well known approximations, the Edgeworth, the Cramer, and a Saddlepoint approximation are described. Another saddlepoint approximation is derived. The problem is discussed of calculating the moment generating function of F sub 1 for complex values of its argument. The four approximations to F sub n are compared for several cases and it is seen that the second saddlepoint approximation yields better results in each case. (Author)

AD-620 290 Div. 15/2
CFSTI Prices: HC $1.00 MF $0.50
STANFORD UNIV CALIF DEPT OF STATISTICS
A WAITING TIME DISTRIBUTION ARISING FROM THE COUPON COLLECTOR'S PROBLEM.
Technical rept.,
by Herman Rubin, and James Zidek. 5 Aug 65, 12p. Rept. no. TR-107
Contract Nonr22552 Proj. NR342 022
Unclassified report

Descriptors: (*Sampling, Distribution theory), Probability, Sequences, Game theory

A certain waiting time distribution is considered which arises in the context of the Coupon Collector's Problem. In general, the term 'Coupon Collector's Problem' refers to the problem which confronts an individual who is attempting to collect a subset of some set of distinct items, by sampling with replacement, one item from this set on each of a sequence of independent trials, until this subset is obtained. The waiting time in question, denoted by S (r,N) (N = 1,2,...; r = 1,2,...,N), is the number of trials needed to obtain for the first time, r distinct elements from among N distinct elements, if each of the sequence of independent trials consists of sampling with replacement and equal probabilities, one element from among the N. The exact distribution of S (r,N) is obtained. Using this result an asymptotic approximation to this distribution is derived for the case r = N. Calculations illustrating the effectiveness of this approximation in the case N = 1000, are given. (Author)

AD-620 291 Div. 15/2
CFSTI Prices: HC $1.00 MF $0.50
STANFORD UNIV CALIF DEPT OF STATISTICS
DISTRIBUTION OF A SUM OF WAITING TIMES IN COUPON COLLECTION.
Technical rept.,
by Gerald Chase, and Herman Rubin. 12 Aug 65, 17p. Rept. no. TR-109
Contract Nonr22552 Proj. NR342 022
Unclassified report

Descriptors: (*Sampling, Distribution theory), Probability, Series, Game theory, Tables

The problem of approximating the distribution of the sum of n times to collect all of M coupons is considered. The Edgeworth expansion is obtained to terms of order n to the -3/2 power. Tables are given for M = 30, n = 8, 16, and 32, of the accuracy of the Edgeworth expansion for the cumulative distribution function approximately (because of discreteness) .001, .01, .1, .9, .99, and .999. (Author)

AD-620 356 Div. 15/2
CFSTI Prices: HC $4.00 MF $1.00
DAVID TAYLOR MODEL BASIN WASHINGTON D C
EVALUATION OF THE PROBABILITY INTEGRAL TO HIGH PRECISION.
Final rept. for Jul 63-Jun 64,
by Francis D. Murnaghan. 0 Jul 65, 130p. Rept. no. 1861
Unclassified report

Descriptors: (*Probability, Integrals), Series, Difference equations, Differential equations, Tables

The 'converging factor' for an asymptotic series representing a function f (x) is that number by which the (n + 1) term of the series must be multiplied so that the result of adding this product to the sum of the first n terms will be f (x). The determination to high precision of this factor for the asymptotic series representing the probability integral is described. Tables of this factor to 63 decimal places are included for n ranging from 2 to 64. (Author)

AD-620 389 **See Fld. 5/3**

AD-620 392 Div. 15/1
CFSTI Prices: HC $4.00 MF $0.75
TEXAS UNIV AUSTIN
INVESTIGATION OF TIME DOMAIN IDENTIFICATION TECHNIQUES.
Doctoral thesis,
by Arthur John Deex. 0 Aug 65, 120p. Contract AF33 608 1121
Unclassified report

Descriptors: (*Functions, Identification), (*Integral transforms, Complex variables), Control systems, Time, Least squares method, Polynomials, Sampling, Programming (Computers), Numerical methods and procedures

Methods are investigated of identifying a rational transfer function in the complex frequency, s, domain, given the impulse response or samples of the impulse response of a time invariant or slowly time varying system. This problem arises in adaptive schemes where g (t), the impulse response of the plant, is characterized by a preliminary identification method. The next step in the identification process is that of determining the coefficients of G (s), the rational transform of g (t). Adaption is based on the form of G (s) and the value of the coefficients of G (s). Several time domain synthesis techniques including least-square fitting, indices of matching, moment matching, and orthogonal methods are considered with a view to digital identification. The analog method of transfer function tracking of Puri and Weygandt is applied to digital identification.

AD-620 397 **See Fld. 9/1**

AD-620 398 **See Fld. 9/1**

AD-620 408 **See Fld. 15/7**

AD-620 427 **See Fld. 13/13**

AD-620 447 Div. 15/1
CFSTI Prices: HC $2.00 MF $0.50
NORTH CAROLINA STATE UNIV RALEIGH
BAER RINGS AND LINEAR TRANSFORMATIONS.
Master's thesis,
by Charles Howard Wheeler. 01965, 29p. Contract AF33 608 1092
Unclassified report

Descriptors: (*Rings, Transformations (Mathematics)), (*Transformations (Mathematics), Rings), Matrix algebra

The first five sections of this thesis are devoted to proving that the ring of all nxn triangular matrices over any field, which is not necessarily commutative, belong to the class of Baer rings, for any finite n. The term Baer ring is used to denote those rings in which the left (right) annihilator of each subset is a principal left (right) ideal generated by an element, say e, in the ring, with the property e . e = e. The sixth section is devoted to proving that in a Baer ring certain ideals, called right and left singular ideals, contain no non-zero elements. The left (right) singular ideal of a ring is a set of elements of the ring whose left (right) annihilators have a non-zero intersection with each non-zero left (right) ideal of the ring. Some indications of why these proofs are significant, a summary of the thesis, and remarks on possible extensions of this work, are the contents of the seventh section. (Author)

AD-620 570 Div. 15/1
CFSTI Prices: HC $2.00 MF $0.50
CALIFORNIA UNIV LOS ANGELES
WEAK BOUNDARY COMPONENTS OF AN OPEN RIEMANN SURFACE.
Doctoral thesis,
by Nevin W. Savage. 0 Apr 56, 49p.
AROD . 1517:2m
Unclassified report

Descriptors: (*Potential theory, Complex variables), (*Complex variables, Potential theory), Boundary value problems, Conformal mapping, Topology, Functions

This thesis is concerned with finding tests for a weak boundary component. (A boundary component is called weak if it has vanishing capacity). Sufficient conditions are derived which ensure that a boundary component be weak. The criteria obtained are valid, not only for planar surfaces but for arbitrary open Riemann surfaces as well.

AD-620 603 Div. 15/1
CFSTI Prices: HC $1.00 MF $0.50
YALE UNIV NEW HAVEN CONN
REGULAR MINIMAL SETS, I.
Technical rept.,
by Joseph Auslander. 01965, 23p. Contract DA31 124ARO D165 Proj. DA 20014501B14C
AROD . 4302:3
Unclassified report

Descriptors: (*Set theory, Groups (Mathematics)), (*Groups (Mathematics), Topology), Transformations (Mathematics), Algebraic topology

A central problem in topological dynamics is the classification of minimal sets. In full generality, this problem appears to be quite difficult. Therefore, it seems appropriate to single out certain minimal sets which are 'well behaved' in some sense, and therefore more amenable to classification. It is for this purpose that we introduce the regular minimal sets in this paper. They are the universal minimal sets for certain ('admissible') properties. Several characterizations are given (theorem 3); the class of regular minimal sets is shown to coincide with the minimal right ideals of enveloping semigroups of transformation groups, and also with those minimal sets having a maximal supply of endomorphisms. (Author)

AD-620 620 Div. 15/1
HARVARD UNIV CAMBRIDGE MASS
ORBITS OF L (1)-FUNCTIONS UNDER DOUBLY STOCHASTIC TRANSFORMATIONS,
by John V. Ryff. 19 Dec 63, 11p. Contract DA31 124ARO D128
AROD . 1617:50
Unclassified report

Pub. in Transactions of the American Mathematical Society v117 n5 p92-100 May 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Stochastic processes, Operators (Mathematics)), (*Functions, Transformations (Mathematics)), Matrix algebra, Topology, Measure theory, Functional analysis

AD-620 633 Div. 15/1
YALE UNIV NEW HAVEN CONN
ON THE LIFTING PROPERTY II. REPRESENTATION OF LINEAR OPERATORS ON R-SPACES L, 1 < OR = R < INFINITY,
by Alexandra Ionescu Tulcea, and Cassius Ionescu Tulcea. 01962, 24p. Contract DA19 020ORD4912
AROD , 3333:19

Unclassified report

Pub. in Journal of Mathematics and Mechanics v11 n5 p773-96 Sep 1962 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Topology, Operators (Mathematics)), (*Operators (Mathematics), Topology), (*Mapping (Transformations), Topology), Integrals, Measure theory, Algebraic topology, Functional analysis

Integral representations are established for various categories of linear operators on an r-space L sub E, 1 ≤ or = r < infinity, to a space F, using the existence of a lifting of a locally compact space. E and F are locally convex spaces.

AD-620 634 Div. 15/1
YALE UNIV NEW HAVEN CONN DEPT OF MATHEMATICS
ON THE LIFTING PROPERTY,
by Alexandra Ionescu Tulcea, and Cassius IonescuTulcea. 01961, 11p. Contract DA ORD12

AROD , 3333:18

Unclassified report

Pub. in Journal of Mathematical Analysis and Applications v3 n3 p537-46 Dec 1961 (Copies available only to DDC users).

Descriptors: (*Mapping (Transformations), Topology), Measure theory, Set theory, Algebras, Functional analysis

A proof is given of a property of the mapping p of T into T which holds that for a tribe (sigma-algebra), T contained in E, there exists a mapping p which satisfies: p (A) identical to A; A identical to B implies p (A) identical to p (B); p (A intersection B) = p (A) intersection p (B); p (A union B) = p (A) union p (B).

AD-620 635 Div. 15/1
PENNSYLVANIA UNIV PHILADELPHIA
ERGODIC PROPERTIES OF ISOMETRIES IN L (P) SPACES, 1<P< INFINITY,
by A. Ionescu Tulcea. 7 Nov 63, 8p. Contract DA ARO D31 124G218
AROD , 3333:10

Unclassified report

Pub. in Bulletin of the American Mathematical Society v70 n3 p366-71 May 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Measure theory, Functional analysis), (*Mapping (Transformations), Measure theory), Topology, Operators (Mathematics)

AD-620 636 Div. 15/1
PENNSYLVANIA UNIV PHILADELPHIA
ON THE LIFTING PROPERTY (IV). DISINTEGRATION OF MEASURES,
by A. Ionescu Tulcea, and C. Ionescu Tulcea. 0 Feb 64, 30p. Contract DA ARO D31 124G218

AROD , 3333:20

Unclassified report

Pub. in ANN. Inst. Fourier, Grenoble v14 n2 p445-72 1964 (Copies available only to DDC users).

Descriptors: (*Mapping (Transformations), Measure theory), (*Measure theory, Mapping (Transformations)), Functional analysis, Topology

The notion of a strong lifting is introduced. Conditions whereby a lifting may be a strong lifting are given. It is shown that a strong linear lifting implies the existence of a strong lifting. Theorems are proved on the disintegration of measures, using the notion of strong lifting. The notion of 'appropriate family of measures', which replaces Bourbaki's notion of 'adequate family', is introduced.

AD-620 637 Div. 15/1
ILLINOIS UNIV URBANA DEPT OF MATHEMATICS
ON THE LIFTING PROPERTY (V),
by A. Ionescu Tulcea. 21 Dec 64, 10p. Contract DA31 124ARO D288
AROD . 3333:21

Unclassified report

Pub. in Annals of Mathematical Statistics v36 n3 Jun 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Mapping (Transformations), Topology), Functional analysis, Measure theory, Set theory

A topology is defined on the set X from a lower density of B, a sigma-algebra of subsets of X.

AD-620 649 Div. 15/1 ,30/5
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP SANTA MONICA CALIF
SYSTEMS MODELING IN ENGINEERING DESIGN,
by Raoul J. Freeman, and D. Calvin Gogerty. 0 Aug 65, 35p. Rept. no. P-3211

Unclassified report

Descriptors: (*Design, Mathematical models), (*Systems engineering, Mathematical models), (*Engineering, Model theory), Computer logic, Costs, Optimization

Outlined in the paper are the elements of a theoretical framework that would be a first step toward structuring comprehensive analytic models applicable to the hardware design process. The long-range purpose would be to advance the state-of-the-art in analyzing the design process and, thus, subsequently make the process itself more efficient. The model could be adapted to many levels of design; major applications would be: (1) in designing for industry where the state-of-the-art is well established (e.g., automobiles, ships, etc.); (2) in refining existing military designs and conceptions (e.g., small changes on liquid ICBM's); and (3) in stimulating engineering creativity via the results of gross analyses on 'futuristic' designs (e.g., submersible aircraft). The design process is viewed in the abstract in the paper, and thus the discussion is not intended to cope fully with the day-to-day diverse influences that the design engineer encounters in practice. It is contended, however, that there is analytic 'content' beyond these day-to-day stresses and strains, and that the latter can be superimposed upon the framework suggested here.

AD-620 651 Div. 15/1 ,30/2
CFSTI Prices: HC $2.00 MF $0.50
DAVID TAYLOR MODEL BASIN WASHINGTON D C
EVALUATION OF COMPLETE AND INCOMPLETE ELLIPTIC INTEGRALS OF THE FIRST AND SECOND KIND.
Final rept. for Jun-Aug 62,
by Stephen Ullom. 0 Jul 65, 26p. Rept. no. 1996 Proj. SR003 08 01 Task 10923

Unclassified report

Originally published as Applied Mathematics Laboratory rept 194 in Jul 63.

Descriptors: (*Integrals, Programming (Computers)), (*Programming (Computers), Integrals), Programming languages

A method for evaluating Legendre's canonical elliptic integrals of first and second kinds is described and analyzed. A FORTRAN program using this method is presented. (Author)

AD-620 655 **See Fld. 18/9**

AD-620 666 **See Fld. 5/4**

AD-620 667 Div. 15/1
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
ON STABILIZING MATRICES BY SIMPLE ROW OPERATIONS,
by Jon Folkman. 0 Sep 65, 20p. Rept. no. RM-4698-PR
Contract AF49 638 700

Unclassified report

Descriptors: (*Matrix algebra, Transformations (Mathematics)), Stabilization, Permutations, Operators (Mathematics), Analog computers

If A is a nonsingular matrix, the existence is proved of matrices P and Q, each a product of diagonal and permutation matrices, such that PAQ is stable; i.e., all of its eigenvalues have negative real part. This question arises in attempting to solve the equation Ax = b with an analog computer. The result is an existence theorem rather than an effective algorithm. The problem of finding a computationally practical method of doing what is shown can be done remains open. The effect that the transformation A to PAQ has on the eigenvalues of A in general is investigated. It is shown that for 'almost every' n by n matrix A, given any n complex numbers, there is a diagonal matrix D such that DA has those n numbers as its eigenvalues. (Author)

AD-620 676 **See Fld. 5/3**

AD-620 684 Div. 15/2
CFSTI Prices: HC $1.00 MF $0.50
BROWN UNIV PROVIDENCE R I DIV OF APPLIED MATHEMATICS
FUNCTIONS OF MARKOV PROCESSES,
by Murray Rosenblatt. 01965, 19p.

Unclassified report

Research supported in part by Office of Naval Research, Washington, D. C.

Descriptors: (*Statistical processes, Functions), Probability, Measure theory, Operators (Mathematics), Statistical distributions

Conditions are discussed under which the first order transition probabilities of the derived process satisfy the Chapman-Kolmogorov equation, and under which the derived process is Markovian itself.

AD-620 711 Div. 15/2
PRINCETON UNIV N J
SHORT-CUT MULTIPLE COMPARISONS FOR BALANCED SINGLE AND DOUBLE CLASSIFICATIONS: PART I, RESULTS.
Revised ed.,
by T. E. Kurtz, R. F. Link, J. W. Tukey, and D. L. Wallace. 0 Oct 64, 68p. Contract NSF G21058 ,PHS FR00013

Unclassified report

Pub. in Technometrics, v7 n2 p95-161 May 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Statistical analysis, Data), Tables, Analysis of variance, Numerical analysis, Errors

Methods are provided for the rapid analysis of data in balanced single and double classifications. Sums

of ranges provide short-cut measures of variability with only slight loss of efficiency. Tables of factors are provided to convert these sums directly into widths of simultaneous confidence intervals for simple comparisons of group totals. Two illustrative examples are treated in detail. The proposed procedures are recommended for routine use in initial analyses, though not to the exclusion of more refined procedures. The paper includes a general discussion of multiple comparison procedures: when they should and should not be used, the importance of confidence procedures and their advantages over significance procedures, choice among multiple comparisons confidence procedures, choice and description of error rates. It does not attempt to compare multiple comparison and multiple decision procedures. (Author)

AD-620 735 **See Fld. 9/1**

AD-620 758 Div. 15/1 ,30/2
CFSTI Prices: HC $6.00 MF $1.25
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
ELEMENTS OF COMPUTER MATHEMATICS,
by S. B. Norkin, R. Ya. Berri, I. A. Zhabin, D. P. Plozkov, and M. I. Rozental. 12 Aug 65, 226p. Rept. no. FTD-MT-64-321
TT , 65-63815

Unclassified report

Edited machine trans. of mono. Elementy Vychislitelnoi Matematiki, Moscow, 1963 p1-210. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Mathematics, Computers), (*Computers, Mathematics), (*Numerical analysis, Computers), Tables, Functions, Equations, Integrals, Differential equations, Polynomials, Least squares method, Harmonic analysis, USSR

Contents: Computation with approximate numbers and calculation of errors; Composition of tables of functions; Approximate solution of equations; Systems of linear equations; Interpolation polynomials; Approximate Calculation of integrals; Approximate integration of differential equations; Linear and parabolic approximation of functions by the method of least squares; and Practical harmonic analysis.

AD-620 765 Div. 15/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
A NUMERICAL METHOD IN A TIME OPTIMAL CONTROL PROBLEM,
by N. E. Kirin. 9 Aug 65, 15p. Rept. no. FTD-TT-65-955
TT , 65-63822

Unclassified report

Unedited rough draft trans. of Metody Vyvhislenii (USSR) n2 p67-7 1963.

Descriptors: (*Numerical methods and procedures, Control systems), (*Optimization, Control systems), Time, Control, Matrix algebra, USSR

AD-620 777 Div. 15/1 ,18/7
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP SANTA MONICA CALIF
FAMILIES OF MODELS,
by Norman C. Dalkey. 0 Aug 65, 32p. Rept. no. P-3198

Unclassified report

Prepared for presentation at the NATO Conference on The Role of Digital Simulation in Operational Research to be held at Hamburg (Germany), 6-10 Sep 65.

Descriptors: (*Game theory, Warfare), (*Mathematical models, Strategic warfare), (*Strategic warfare, Mathematical models), Military strategy, Operations research, Armed forces operations, Model theory, Kill probability

AD-620 802 Div. 15/2 ,30/2
CFSTI Prices: HC $1.00 MF $0.50
DAVIDSON LAB STEVENS INST OF TECH HOBOKEN N J
FORTRAN II SUBROUTINE FOR LEAST-SQUARES POLYNOMIAL FITTING BY ORTHOGONAL POLYNOMIALS,
by Paul H. Rank,Jr.. 0 Apr 65, 9p. Rept. no. N-727
Contract Nonr26336 Proj. DL LK2321 036

Unclassified report

Descriptors: (*Programming (Computers), Polynomials), (*Polynomials, Least squares methods), Programming languages, Compilers, Curve fitting

13/1. AIR CONDITIONING, HEATING, LIGHTING, AND VENTILATING

AD-620 167 **See Fld. 15/3**

AD-620 555 Div. 7/4 ,31/9
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
DEVELOPMENT OF A SHOCK RESISTANT INDICATOR LIGHT.
Final rept.,
by J. D. Haynsworth. 9 Jun 48, 9p. Rept. no. NRL-3295

Unclassified report

Previously announced Apr 60 as PB-129 289, LC mi$1.80, ph$1.80.

Descriptors: (*Indicator lights, Naval equipment), Shock resistance, Flexible couplings

A shock-resistant 120-volt switchboard indicator light for use aboard naval vessels was developed. The light consists of a resiliently mounted fixture and a special lamp with multiple-filament supports. It is resistant to high-impact shock such as may result from battle conditions. It is applicable directly to 120-volt circuits and, with an 18-watt series resistor, to 440-volt circuits. Where space permits it can be used to replace the present 6-volt Navy standard switchboard light with a minimum of switchboard modification.

13/2. CIVIL ENGINEERING

AD-620 654 Div. 33/2 ,28/1
CFSTI Prices: HC $1.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
THE EFFECT OF DRIVER REACTION TIME ON THROUGHPUT AT A SATURATED SIGNALIZED INTERSECTION.
Professional paper,
by C. J. Ancker,Jr., and A. V. Gafarian. 26 Aug 65, 23p. Rept. no. SP-2122/000/00

Unclassified report

Descriptors: (*Traffic, Mathematical models), (*Reaction (Psychology), Traffic), Reflexes, Signals, Queueing theory, Passenger vehicles, Stochastic processes, Integration, Probability, Systems engineering

The effect of random driver reaction time on throughput at a saturated signalized intersection is studied. The model assumes zero acceleration time and identical terminal velocities for all vehicles. Analytic expressions are derived for the average number of vehicles that pass through the intersection during a go-period. Some calculations and curves are given for the specific case of a general gamma distribution function for the reaction time variable. It is shown that a mean value model is quite accurate for mean value purposes, but that variability in reaction time does cause significant variance in throughput. (Author)

13/3. CONSTRUCTION EQUIPMENT, MATERIALS AND SUPPLIES

AD-620 421 Div. 13/2 ,13/4
CFSTI Prices: HC $3.00 MF $0.75
PITTSBURGH UNIV PA
EFFECT OF VARIATION OF AGGREGATE GRADATION ON MODEL CORRELATION.
Master's thesis,
by Richard J. Horsma. 01965, 70p. Contract AF33 608 1104

Unclassified report

Descriptors: (*Reinforced concrete, Model tests), (*Beams (Structural), Model tests), Loading (Mechanics), Deflection, Stresses, Strain (Mechanics), Steel

The load-strain curves of the prototypes for both the steel and concrete were accurately represented by the model beams. The aggregate gradation variation had no significant effect on the correlation. The loaddeflection curves of the model beams failed to represent the prototype beams as based on model theory. Prototype deflections averaged 2.2 times the model deflections instead of four times as indicated by model theory. Alami found that models with a linear scale as low as .334 satisfactorily correlated deflections. This investigation used models having a linear scale of .25. This tends to indicate that a lower limit on linear scale exists which will correlate deflections. The two methods used to locate the neutral axis, namely, from concrete and steel strains, and by measuring elongations about the neutral axis with the Whitmore gage, were in close agreement. The neutral axis location in the prototype series was closely represented by all model series. (Author)

13/4. CONTAINERS AND PACKAGING

AD-620 168 **See Fld. 22**

13/6. GROUND TRANSPORTATION EQUIPMENT

AD-620 138 **See Fld. 15/7**

AD-620 144 **See Fld. 1/4**

AD-620 405 Div. 33/3 ,32/4
CFSTI Prices: HC $4.00 MF $0.75
TENNESSEE UNIV KNOXVILLE
AN ANALYSIS OF INTERSTATE COMMERCE COMMISSION POLICY REGARDING JOINT USE AND OWNERSHIP OF RAILROAD TERMINAL FACILITIES.
Master's thesis,
by Edward K. Lyons. 0 Aug 65, 127p. Contract AF33 608 1118

Unclassified report

Descriptors: (*Railroads, Economics), Transportation, Law, Buildings, Costs, Standards, United States Government

13/7. HYDRAULIC AND PNEUMATIC EQUIPMENT

AD-620 233 **See Fld. 19/5**

AD-620 440 Div. 26/8
CFSTI Prices: HC $3.00 MF $0.75
OKLAHOMA UNIV NORMAN
DETERMINATION OF STABILITY PARAMETERS FOR TWO PHASE NATURAL CIRCULATION HYDRAULIC LOOPS AT HIGH PRESSURE.

Master's thesis,
by John R. Bode. 01965, 70p. Contract AF33 608 1096

Unclassified report

Descriptors: (*Hydraulic fluids, Stability), (*High pressure research, Hydraulic fluids), Enthalpy, Combustion, Programming (Computers), Difference equations

AD-620 778 **See Fld. 17/7**

13/8. INDUSTRIAL PROCESSES

AD-620 098 Div. 26/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
INTRODUCTION OF A SYSTEM OF DEFECTLESS MANUFACTURE IN INDUSTRIAL PRODUCTION,
by A. S. Nefedov. 10 Jun 65, 9p. Rept. no. FTD-TT-65-549
TT , 65-63334

Unclassified report

Unedited rough draft trans. of Byulleten' TekhnikoEkonomicheskoi Informatsii (USSR) n2 p10-12 1965.

Descriptors: (*Industrial production, Quality control), (*Management engineering, Industrial production), Production control, Industrial equipment, Automation, USSR

AD-620 124 Div. 26/1 ,14/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
A METHOD OF FASTENING RUBBER TO FABRIC,
by M. S. Dostyan, and I. L. Shmurak. 11 Jun 65, 5p. Rept. no. FTD-TT-65-192
TT , 65-63342

Unclassified report

Unedited rough draft trans. of Russian patent 159977, pub. 9 Aug 62, appl. 790458/23-4. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Rubber, Bonding), (*Bonding, Tires), USSR, Patents, Elastomers, Synthetic rubber, Textiles, Adhesives, Tin compounds, Chlorides, Polymers

The object of the invention is a method of making rubber adhere to fabric. To improve the strength of the bond at the contact between rubber and rubber and rubber and fabric into the rubber mixture there is introduced 0.1 to 5 parts by weight of dichloride of tin. (Author)

AD-620 131 Div. 26/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
METHOD OF ELECTROSLAG WELDING WITH A PLATE ELECTRODE,
by A. Ya. Shvartser. 27 May 65, 5p. Rept. no. FTD-TT-65-485
TT , 65-63349

Unclassified report

Unedited rough draft trans. of Russian Patent 160785, pub. 26 Feb 64, appl. 758478/25-8, 1p.

Descriptors: (*Welding, Electrodes), USSR, Patents, Electrodes

The purpose of the invention is a method of electroslag welding with a plate electrode. In order to carry out the process with a stationary electrode, the latter has a width which exceeds the thickness of the metal being welded. (Author)

AD-620 140 **See Fld. 13/13**

AD-620 158 **See Fld. 11/8**

AD-620 166 **See Fld. 8/9**

AD-620 181 **See Fld. 11/6**

AD-620 234 Div. 26/1 ,17/5
CFSTI Prices: HC $3.00 MF $0.75
NAVAL APPLIED SCIENCE LAB BROOKLYN N Y
FATIGUE OF STRUCTURAL ELEMENTS DEVELOPMENT OF THEORY AND MEASUREMENT OF RESIDUAL STRESSES AT TEE FILLET WELDS IN 1-1/2 INCH HY-80 STEEL.
Progress rept.,
by H. V. Cordiano, W. Werchniak, and B. S. Silverman. 13 Sep 65, 73p. Rept. no. 9300-23, PR-1
Proj. SF-013-013-02 Task 2025

Unclassified report

Descriptors: (*Steel, Welds), (*Welds, Stresses), Measurement, Surface properties, Strain (Mechanics), Theory, Mathematical analysis, Cold working

A theory has been developed for the calculation of relaxation strains when a hole is drilled into a plate with a linearly varying stress field. With this theory a technique was developed for the measurement of residual stresses at the toe of tee fillet welds. The above technique was employed for the measurement of residual stresses at the toe of tee fillets in 1 1/2 in. HY-80 steel with the fillet in the as welded, ground, shot-peened, ground and shot-peened, and mechanically-peened condition. It was found that experimental data conform to the assumed theory, and that residual stresses in as welded tee fillet welds in both the transverse and longitudinal directions approach the yield strength of the steel. It was also found that residual stresses are reduced approximately 25 percent by grinding, 50 percent by shot peening and 50 percent by grinding and shot peening. Mechanical peening drastically affected residual stresses by converting high tension at the toe of the fillet weld to high compression of approximately the same magnitude. (Author)

AD-620 385 **See Fld. 14/2**

AD-620 404 Div. 26/4 ,26/1
CFSTI Prices: HC $2.00 MF $0.50
MONTANA STATE UNIV MISSOULA
FORCED VIBRATION OF UNEVENLY DISTRIBUTED MASSES.
Master's thesis,
by Richard Randolph Frank. 0 Aug 65, 45p.

Unclassified report

Descriptors: (*Material separation, Rock (Geology)), (*Vibrators (Mechanical), Material separation), Particle size, Vibration, Harmonic oscillators, Stroboscopes, High-speed photography, Programming (Computers)

Forced vibration has been used extensively in the transportation or separation of various sized particles. The forcing frequency is usually created with a rotating or reciprocating unbalance that impresses a periodic, harmonic motion. This motion is directed to impart both a horizontal and a vertical movement to the particle. The development of the equations is shown, with their boundary conditions, that describe the motion of unattached particles on a vibrating platform. Results from these theoretical equations were tabulated in table form and compared with the test results. A high powered stroboscope was used with a photoelectric pickoff and a flash delay to photograph various stages in the cycle of rock particles on a vibrating platform. The position of the eccentric weights was used as a marker to determine the point in the vibrating platform's cycle that the photographs were taken. Various exciting frequencies and exciting forces were photographed for comparison with the theoretical results.

AD-620 435 **See Fld. 6/16**

AD-620 508 Div. 26/1 ,17/4
CFSTI Prices: HC $4.00 MF $1.00
BATTELLE MEMORIAL INST COLUMBUS OHIO
MACHINING AND GRINDING OF TITANIUM AND ITS ALLOYS.
NASA Technical memo.,
by C. T. Olofson, F. W. Boulger, and J. A. Gurklis. 4 Aug 65, 131p. Contract DA01 021AMC11651Z
NASA ,RSIC TM-X-53312; ,409

Unclassified report

Subcontracted to Redstone Scientific Information Center, Redstone Arsenal, Ala.

Descriptors: (*Titanium, Material removal), (*Titanium alloys, Material removal), (*Material removal, Titanium), Machining, Machine tools, Grinders, Precision finishing, Chemical milling, Cutting tools, Performance (Engineering)

The report covers the state of the art of metal-removal operations for titanium and its alloys. It describes the methods currently employed for conventional machining, grinding, electrolytic, and chemical machining processes. The precautions which should be taken to avoid troubles resulting from the characteristics typical of titanium are pointed out. Ten machining, two grinding, two cutting, and two unconventional metal-removal operations are discussed separately. In other sections, the mechanics of chip-forming processes, the response to machining variables, costs, and precautions desirable from the standpoint of safety are discussed. (Author)

AD-620 509 Div. 26/1 ,17/4
CFSTI Prices: HC $3.00 MF $0.75
BATTELLE MEMORIAL INST COLUMBUS OHIO
ADHESIVE BONDING OF TITANIUM AND ITS ALLOYS.
NASA Technical memo.,
by R. E. Keith, R. E. Monroe, and D. C. Martin. 4 Aug 65, 97p. Contract DA01 021AMC11651Z
NASA ,RSIC TM-X-53313; ,414

Unclassified report

Subcontracted to Redstone Scientific Information Center, Redstone Arsenal, Ala.

Descriptors: (*Titanium alloys, Bonding), (*Bonding, Titanium alloys), Adhesives, Surfaces, Preparation, Aging (Materials), Tests, Beams (Structural), Rocket cases, Fuel tanks, Honeycomb cores, Sandwich panels, Panels (Structural)

The report covers the state of the art of adhesive bonding of titanium and its alloys and is oriented toward the interests of the designer and the manufacturing engineer. In it are described typical joint designs, surface preparation procedures, types of adhesives used for bonding, environmental factors as they influence choice among available adhesives, processing techniques, representative applications of adhesive bonding, and available test results on adhesive-bonded titanium alloys. (Author)

AD-620 526 Div. 26/1 ,17/4
CFSTI Prices: HC $1.00 MF $0.50
WESTINGHOUSE ASTRONUCLEAR LAB PITTSBURGH PA
PILOT PRODUCTION AND EVALUATION OF TANTALUM ALLOY SHEET.
Quarterly rept. no. 11, 15 Mar-15 Jun 65,
by R. L. Ammon, A. M. Filippi, and R. C. Goodspeed. 25 Aug 65, 22p. Rept. no. WANL-PR-M-013
Contract NOw64 0394d

Unclassified report

See also AD-613 356.

Descriptors: (*Tantalum alloys, Rolling (Metallurgy)), (*Rolling (Metallurgy), Tantalum alloys), Sheets, Hafnium alloys, Tungsten alloys, Carbon alloys, Forging, Surface properties, Phase studies, Heat treatment, Microstructure, Hardness, Aging (Materials)

Eighteen and twenty-four inch wide T-222 sheet has been obtained by rolling slabs produced by direct forging 4-inch diameter ingots. One sheet has been sampled for detailed chemical analysis and mechanical property studies. Although the investigations are not yet complete, initial recrystallization results show a behavior analogous to that described for T-222 sheet produced for smaller ingots. Size and shape of second phases occurring in solution treated and aged T-222 samples were studied by means of electron microscopy. The dimetal carbide occurring upon aging at 2000 F principally grows as a platelet several thousand angstroms in thickness. The monocarbide developed upon aging at 2800 F appears as a very fine dispersoid submicron in size. (Author)

AD-620 556 Div. 26/1 ,17/5
CFSTI Prices: HC $2.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
STRESS RELIEF OF GRAY CAST IRON,
by J. H. Schaum. 9 Jun 48, 26p. Rept. no. NRL-3296

Unclassified report

Previously announced 31 Aug 53 as PB-109 572, LC mi$2.00, ph$3.75.

Descriptors: (*Iron alloys, Heat treatment), (*Heat treatment, Iron alloys), Castings, Stresses, Carbon alloys, Temperature, Aging (Materials), Cooling, Relaxation time

The report describes a number of experiments on the stress relief of gray cast iron. One set of experiments consisted of making relaxation tests and using the rate of relaxation as a means of evaluating stress relief. These studies showed that: (1) the rate of stress relief is most rapid during the first hour at temperature; (2) the rate of stress relief is very slow below 1000 F, but increases as the temperature is raised; and (3) initial stress and alloy composition have an important influence on the rate of stress reduction by heat treatment. Observations of heat treatments on highly stressed cast wheels revealed that (1) indoor aging and low-temperature (600 F) heat treatment are ineffective for stress relieving, (2) furnace cooling after heat treatment produces lower residual casting stresses than air cooling, and (3) relaxation tests agree closely with results of stress-relief heat treatments of experimental castings. (Author)

AD-620 557 Div. 26/4 ,26/1 ,17/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
TENSILE AND TRANSVERSE TESTING OF GRAY CAST IRON,
by J. H. Schaum. 23 Jun 48, 23p. Rept. no. NRL-3304

Unclassified report

Previously announced 2 Jun 53 as PB-111 141, LC mi$2.25, ph$4.00.

Descriptors: (*Iron, Castings), (*Castings, Test methods), Tensile properties, Molding, Hardness, Carbon, Graphite, Tests, Extensometers, Deformation

The report discusses the types and causes of defects in transverse test bars. The quality of the bars was improved by using a chromium plated steel pattern, fine grained sand, horizontal ramming of the mold, and horizontal pouring followed immediately by setting the casting in the vertical position. A rapid, accurate, and inexpensive transverse testing technique was developed using an extensometer dial anchored to the testing machine ram with the dial pin in contact with a rigid reference bar. Problems encountered in judging the strength of a casting are described in a study of the effect of the size and location of tensile specimens. (Author)

AD-620 558 Div. 26/1 ,17/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
INSULATION OF RISERS FOR FERROUS CASTINGS,
by J. R. Power. 24 Sep 48, 15p. Rept. no. NRL-3360

Unclassified report

Previously announced 13 Jan 53 as PB-111 071 LC mi$2.00, ph$2.75.

Descriptors: (*Molding, Thermal insulation), (*Casting, Iron alloys), (*Iron, Castings), (*Steel, Castings), Molding materials

The report describes experiments conducted with an inexpensive method of insulating risers on iron and steel castings in order to obtain a higher yield. The insulating material, a mixture of 40 percent by weight of sawdust with 26 percent dextrine and 34 percent water, is pressed into the desired shapes, dried, coated with a refractory wash, and molded in position upon a pattern to form a riser cavity. A series of steel and cast-iron cubes of various sizes were cast with insulated and uninsulated risers to compare feeding efficiencies. When insulated risers are employed, the risers can be reduced in volume by at least 50 percent. This riser insulating method has these disadvantages: (1) it produces a segregated area of high carbon content in the casting, (2) it causes boiling or spattering of the metal in the riser unless precautions are taken to keep the insulation dry and (3) the amount of gases discharged to the foundry atmosphere is excessive. (Author)

AD-620 559 Div. 26/1 ,17/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
GATING SYSTEMS FOR METAL CASTING,
by William H. Johnson, and William O. Baker. 13 Sep 48, 22p. Rept. no. NRL-3355

Unclassified report

Previously announced 22 Aug 49 as PB-97 403 LC mi$1.75, ph$2.50.

Descriptors: (*Molding, Design), (*Casting, Fluid flow), (*Steel, Casting), Turbulence

The investigation was made to observe the effects of gate design upon the flow and turbulence of liquid steel as a casting is poured. Gating systems and pouring techniques such as top pouring, whirl gates, riser gates, finger gates, horn gates, step gates and bottom side gates were studied. The results of these studies showed that many gating systems did not function as commonly supposed. The behavior of each system is described. To observe the discharge of molten steel into mold cavities, use was made of motion pictures at 64 frames per second. High-speed photography at 1000 frames per second was used in a study of the flow of molten steel through sprues. The most interesting scenes of flow and turbulence produced by the various gating systems have been assembled into a 16-mm sound film. (Author)

AD-620 560 **See Fld. 11/6**

AD-620 568 Div. 26/1 ,17/5
CFSTI Prices: HC $2.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
SOME OBSERVATIONS ON UNDERBEAD CRACKING IN WELDING OF HIGH-TENSILE LOW-ALLOY STEEL.
Final rept.,
by J. A. Rinebolt, and J. O. Mack. 14 Mar 49, 32p. Rept. no. NRL-3390

Unclassified report

Previously announced 10 Jul 53 as PB-111 155, LC mi$2.50 ph$5.25.

Descriptors: (*Steel, Welding), (*Welding, Steel), (*Fracture (Mechanics), Welds), Tensile properties, Metal plates, Hardness, Thickness, Test methods

Description and results of test for detection and measuring of underbead cracks in welding of high-tensile steels and the effects of chemical and physical properties and welding conditions upon the formation of the cracks. It was found that cracking increased with thickness up to about one inch, and then decreased with further increases in thickness. Cracking also increased with increase of carbon and manganese. No correlation was observed between cracking and tensile strength, plate hardness, and heat input within the welding ranges used. (Author)

AD-620 569 Div. 26/1
CFSTI Prices: HC $2.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
SEGREGATION IN SMALL STEEL CASTINGS.
Final rept.,
by H. F. Bishop. 22 Nov 48, 32p. Rept. no. NRL-3389

Unclassified report

Previously announced 10 Jul 53 as PB-109 287, LC mi$2.25, ph$5.00.

Descriptors: (*Steel, Castings), (*Casting, Steel), Structural properties, Carbon, Molding

Carbon segregation in small castings often occurs near riser necks. Systematic studies were continued to determine effect on segregation of such interrelated factors as size and shape of riser and casting, and design of riser contact. Results from numerous specimens show quantitatively that intensity of carbon segregation under 'neck-down' risers varies directly as the neck length and inversely as the neck diameter. The degree of segregation also increases as the section thickness of the casting increases. Segregation beneath 'knock-off' riser contacts is minimized by (1) larger neck diameters, (2) shorter necks, (3) use of exothermic materials for 'knock-off' riser cores, (4) increase in ratio of riser thickness to casting thickness, or (5) any combination of these. Centerline segregation, resembling that in ingots, was found in long, slender castings, but this segregation relates more to centerline shrinkage than to riser contact design. Centerline segregation is reduced by increasing the taper of castings to provide more complete feeding. (Author)

AD-620 585 Div. 26/4 ,30/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
THE VALUE OF PRESSURE TESTS AND RADIOGRAPHS OF GUN METAL CASTINGS,
by William H. Baer. 8 Mar 47, 23p. Rept. no. NRL-3254

Unclassified report

Previously announced 31 Mar 53 as PB-109 748, LC mi $2.00, ph $3.75.

Descriptors: (*Bronze, Castings), (*Castings, Radiography), (*Radiography, Castings), Metal plates, Tin alloys, Zinc alloys, Non-destructive testing, Hydrostatic pressure

Cast gun metal plates 1 in. x 8 in. x 6 in. of composition 88 Cu - 8 Sn - 4 Zn, containing defective areas, were investigated by radiography and tested under hydrostatic pressure. After machining metal from both sides of the castings, radiographs were taken and the castings pressure tested at the new thicknesses. The plates were divided into four major classifications by the appearance of the radiographs of the one-inch section. Radiographs of castings that were pressure-tight and castings which leaked are shown. It was concluded that

castings intended for critical use should be radiographed as well as pressure tested. (Author)

AD-620 599 See Fld. 9/1

AD-620 743 Div. 26/1
CFSTI Prices: HC $2.00 MF $0.50
RENNSELAER POLYTECHNIC INST TROY N Y DEPT OF MATERIALS ENGINEERING
MEASUREMENT OF WELD THERMAL CYCLES IN 2-INCH TITANIUM PLATE.
Final technical rept.,
by Warren F. Savage, and Yoshikuma Ishikawa.
1 Jan 64, 41p. Contract N161 25452
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Titanium alloys, Welding), (*Welding, Titanium alloys), Metal plates, Aluminum alloys, Tin alloys, Temperature, Welds

In order to get basic data for welding, thermal cycles were determined for points adjacent to metallic-arc-welds in 2-inch Ti-5Al-2.5 Sn alloy plate, for last-pass and midplate positions, at energy inputs of 17.5 to 28.4 kilojoules per inch with preheat temperatures of 75 to 300F. These data were presented in a general form to permit calculation of the instantaneous temperature at any time and distance from the weld centerline for any given welding conditions of an arc weld in 2-in. Ti5Al-2.5 Sn alloy plate. Furthermore, it is anticipated that these data will be applicable to many titanium-base alloy plates thicker than 1 inch without any significant errors. (Author)

AD-620 766 Div. 26/3 ,14/8
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
PROBLEMS OF TECHNICAL PROGRESS IN MACHINE CONSTRUCTION OF THE REPUBLIC,
by S. Minasyan. 24 Aug 65, 13p. Rept. no. FTD-TT-65-438
TT , 65-63823
Unclassified report

Unedited rough draft trans. of Promyshlennost' Armenii (USSR) v5 n2 p7-10 1962.

Descriptors: (*Plastics industry, USSR), (*Industrial production, USSR), (*Machines, Industrial production), Industrial equipment, Manufacturing methods, Industrial research

The feasibility of using plastics in the construction of machines is discussed.

AD-620 767 See Fld. 7/1

AD-620 773 See Fld. 11/6

AD-620 774 Div. 26/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
METHOD OF DIFFUSION BONDING IN A VACUUM,
by N. F. Kazakov, A. V. Krivoshei, and E. G. Sudenkov. 13 Aug 65, 5p. Rept. no. FTD-TT-65-637
TT , 65-63831
Unclassified report

Unedited rough draft trans. of Russian Patent 163 874, pub. 29 Sep 62, appl. no. 796663/25-8.

Descriptors: (*Diffusion bonding, Vacuum), USSR, Patents, Controlled atmospheres, Ceramic materials, Alloys, Transformation, Heating

The object of the invention is a method of diffusion welding in a vacuum in accordance with the patent No. 112460 which intensifies the diffusion process by a cyclic raising and lowering of the temperature of heating of the material within the limits of=30 to 100C above and below the temperature of the phase transformation, keeping within the limiting temperatures and repeating this cycle until one is sure of phase transformation of not less than 10 to 20% of the grain of the alloy in the course of each cycle. (Author)

AD-620 808 Div. 26/1 ,14/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
ABOUT ABRASIVE PROPERTIES OF STEEL EROSION PRODUCTS DURING ELECTROSPARK PROCESSING,
by N. V. Afanasev, and A. G. Goloveiko. 19 Aug 65, 10p. Rept. no. FTD-TT-65-451
TT , 65-63851
Unclassified report

Unedited rough draft trans. of Elektroiskrovaia Obrabotka Metallov (USSR) v7 p134-8 1963.

Descriptors: (*Spark machining, Abrasives), (*Steel, Abrasives), (*Abrasives, Powder metals), (*Powder metals, Abrasives), Boron compounds, Silicon compounds, Carbides, Erosion

An investigation was made of abrasive properties of metal powders, obtained by the electro-spark method. Investigated were steels 40KH, 2KH13, R18, and alloy T15K6, as well as boron and silicon carbides. Dispersion of these materials took place in kerosene with the aid of an electro-spark installation. The investigated material in amount of 100 mg, wettened by 2-3 droplets of water, was introduced between the glass and steel disks. The abrasive properties of the materials were measured by the wear of the glass disk after each 3000 revolutions and quantitatively evaluated on the basis of the following values: wear intensity of glass disk, representing the magnitude of wear, calculated per one revolution; by relative intensity of wear (ratio of wear intensity under effect of metal powders I sub e to wear intensity under effect of boron or silicon carbidy powders I sub k); and relative summary wear (ratio of summary wear under effect of metal powd◆s within any given testing time to summary wear under effect of silicon or boron carbide powders during the very same testing time).

13/9. MACHINERY AND TOOLS

AD-620 166 See Fld. 8/9

AD-620 269 Div. 26/6 ,5/2 ,7/5
CFSTI Prices: HC $2.00 MF $0.50
ROTRON MFG CO WOODSTOCK N Y
THE DEVELOPMENT OF A GAS LUBRICATED BEARING BLOWER ASSEMBLY FOR USE IN AN AN/TED9 RADIO TRANSMITTER.
Interim development rept. for 3 May-3 Aug 65.
3 Aug 65, 27p. Contract NObsr87522
Unclassified report

See also AD-615 820.

Descriptors: (*Gas bearing, Design), (*Blowers, Gas bearings), (*Radio transmitters, Gas bearings), (*Journal bearing, Gas bearings), (*Thrust bearing, Gas bearings), Electric motors, Performance (Engineering), Stability, Loading (Mechanics), Frequency converters, Electric filters, Velocity

Investigations of the modes of instability of plain cyclindrical journal gas bearings were conducted and the results are presented. The continued development of a converter driven blower using self acting gas bearings for use in an AN/TED-9 Transmitter is described. (Author)

13/10. MARINE ENGINEERING

AD-620 135 Div. 31/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
ON THE DETERMINATION OF THE DECK MOTION OF AIRCRAFT CARRIERS.
Interim rept.,
by P. A. Crafton. 19 Jul 65, 13p. Rept. no. NRL-6215
Proj. RF002-06-41-4200
Unclassified report

Descriptors: (*Aircraft carriers, Flight decks), (*Flight decks, Motion), All-weather aviation, Carrier landings, Aviation accidents, Probability, Analog computers, Determination, Accelerometers, Differential equations, Roll, Pitch (Motion), Yaw, Stability

A method is presented for determining the deck motion of an aircraft carrier in terms of the local reference coordinate system of the ship. Determination of motion is a prelude to prediction, and prediction is required to facilitate safe landing operations under all weather conditions. Both determination and prediction are necessary in terms of the same local reference coordinate system as that used by the landing aircraft themselves. The finding of the deck motion is deterministic rather than stochastic, inasmuch as the probability of knowing the sea state at any given time and place and the ship's dynamic response thereto is less than the probability of a landing accident not occurring. The motion would be determined by a differential analyzer solving a system of six differential equations of ship motion. Inputs to the differential analyzer are readings of the accelerometers and the latitude and longitude data of the ship. The accelerometers are fixed to the body axes of the vessel, and 'stable platforms' are therefore not required. Computation is thus performed only by electronic means. (Author)

AD-620 218 See Fld. 5/11

AD-620 553 Div. 31/1 ,13/11
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
DEVELOPMENT OF FIRE ALARM THERMOSTAT OTHER THAN MERCURY-IN-GLASS.
Final rept.,
by R. Gareau. 7 Oct 48, 17p. Rept. no. NRL-3365
Unclassified report

Previously announced Apr 60 as PB-130 107, LC mi $2.40, ph$3.30.

Descriptors: (*Fire alarm systems, Thermostats), (*Thermostats, Fire alarm systems), Shock resistance, Vibration isolators, Marine safety equipment

It was desired to investigate all types of mechanical and electrical fire alarm thermostats, other than mercurial, that would retain advantages of the mercurial and, in addition, be inherently resistant to high-impact shock. Attention was concentrated on a differential control thermostat recently modified for fixed-temperature (fire alarm) applications. Preliminary shock tests disclosed the need for some shock protection. Various methods of shock mounting were considered and a simple shock mount was developed adequately to protect the themostat from high-impact shock. Tests show this shock-mounted thermostat may be used as alternate for the mercury-in-glass type provided the tolerance in operating point is increased to = 5F and the integral low-temperature alarm feature is not required. (Author)

AD-620 555 See Fld. 13/1

13/10.1 SUBMARINE ENGINEERING

AD-620 113 See Fld. 11/7

AD-620 165 See Fld. 11/6

AD-620 218 See Fld. 5/11

AD-620 543 Div. 31/4 ,13/4 ,5/6
CFSTI Prices: HC $2.00 MF $0.50
NAVAL ORDNANCE LAB WHITE OAK MD
COLLAPSE TESTS OF ROUND NON-FERROUS TUBING UNDER EXTERNAL HYDROSTATIC PRESSURE,
by George W. Peet. 19 Aug 65, 38p. Rept. no. NOLTR-65-135
Proj. RMMO-32 023 212 1F008 17 02

Unclassified report

Descriptors: (*Visual signals, Underwatertosurface), (*Pipes, Hydrostatic pressure), (*Containers, Visual signals), Tests, Pressure vessels, Theory, Mathematical prediction, Aluminum alloys, Magnesium alloys, Graphics, Structral shells, Structures, Mathematical analysis

The results of limited collapse tests with round, nonferrous tubing, under radial and axial external hydrostatic pressure, are reported herein and are compared with the predictions of two existing collapse theories. The agreement of both theories with the data is variable and generally exceeds plus or minus ten percent. An empirical form holds promise of more accurate collapse pressure predictions, but the data are too limited for satisfactory definition of the terms. (Author)

13/12. SAFETY ENGINEERING

AD-620 331 See Fld. 15/3

AD-620 553 See Fld. 13/10

AD-620 741 Div. 13/11,18/1
CFSTI Prices: HC $3.00 MF $0.75
BIO-DYNAMICS INC CAMBRIDGE MASS
SMALL COMMUNITY FIRE FIGHTING RESOURCES FOR MAJOR FIRE DISASTERS.
Final rept.,
by D. B. Haswell, D. W. Williams, and T. J. Cummings. 15 Apr 65, 80p. Contract OCD PS64 39

Unclassified report

Descriptors: (*Fire safety, Urban planning), (*Urban planning, Fire safety), (*Civil defense systems, Fire safety), Urban areas, Disasters, Fires, Simulation, Civil defense personnel, Civilian personnel, Communication systems, Police, Medical personnel, Medical supplies, Nuclear warfare

The results are presented of a study which was conducted to determine the preparedness of small communities (18,000-25,000 population) to cope with major fires and contingencies arising from severe natural or nuclear disasters. Several New England communities were studied. The strategy employed involved extensive use of field discussions with personnel representing both the fire service and various levels of the Civil Defense organization. It was determined that the majority of smaller communities are insufficiently prepared to cope effectively with extended disaster situations. The reasons for these deficiencies are discussed, and collectively represent insufficient preplanning at various levels of the state and local fire and civil defense organizations. Recommendations voiced by members of these groups to correct this situation are noted, supplemented when applicable by bibliographic references. A summary of a 'model' community disaster plan, including organization and operational procedures, is described. A manual for assisting small communities in preplanning and in assessing their preparedness for major fires and contingencies arising from cataclysmic disasters is presented. (Author)

13/13. STRUCTURAL ENGINEERING

AD-620 140 Div. 13/4 ,26/1
CFSTI Prices: HC $1.00 MF $0.50
ARMY ELECTRONICS COMMAND FORT MONMOUTH N J
EXPERIMENTAL MAST SECTION JOINT DEVELOPMENT.
Technical rept.,
by William J. Librizzi, and Richard L. Johnson.
0 Jan 65, 25p. Rept. no. ECOM-2611
Proj. 1E6'34301 D244 Task 1E6-34301D244-06

Unclassified report

Descriptors: (*Antenna masts, Metal joints), (*Joining, Antenna masts), Welding, Bonding, Epoxy plastics, Clamps, Disconnect fittings, Portable, Couplings, Experimental data, Loading (Mechanics), Deflection, Pipes, Deformation

A study was made using four specimen joints of a fast-lock sleeve design. The joining techniques used were welding, and epoxy bond. The epoxy use was varied; the method of application was varied; and the amount of heat and/or pressure used to distribute the epoxy was varied. The study was extended to include tests of the production joint from Mast AB-577/G which uses the Marman Clamp. These test results are compared. (Author)

AD-620 168 See Fld. 22

AD-620 385 See Fld. 14/2

AD-620 390 Div. 13/4
CFSTI Prices: HC $4.00 MF $0.75
TEXAS UNIV AUSTIN
DEVELOPMENT OF CONTINUITY BETWEEN PRECAST-PRESTRESSED CONCRETE BEAMS UTILIZING POST-TENSIONING.
Master's thesis,
by Kay G. Blahauvietz. 0 Aug 65, 126p. Contract AF33 608 1121

Unclassified report

Descriptors: (*Beams (Structural), Reinforced concrete), (*Reinforced concrete, Beams (Structural)), Loading (Mechanics), Structural properties, Fracture (Mechanics), Moments, Reinforcing materials

The study presented utilized draped post-tensioned tendons, coupled over the interior support, as well as conventional bar and special prestressed reinforcement in the cast-in-place slab, to establish the continuity between the precast-prestressed beams. The results indicate that post-tensioned and prestressed reinforcement tend to restrain the formation of cracks and to close them when the load is removed. When the maximum negative moment is reached, moment redistribution takes place prior to collapse of the specimen. It was also determined that the actual positive moments are always greater than those predicted by elastic theory and conversely, the actual negative moments are always less than the elastic moments. The ultimate strength theory using the rectangular stress block was found to be safe for use in the design of the continuity connections. For the two-span beam tested redistribution of moments did occur allowing the member to carry the full ultimate load which would be predicted using limit analysis.

AD-620 418 See Fld. 8/2

AD-620 421 See Fld. 13/3

AD-620 427 Div. 13/4 ,15/1 ,30/2
CFSTI Prices: HC $3.00 MF $0.75
PITTSBURGH UNIV PA
COGO-1, A PROGRAMMING SYSTEM FOR CIVIL ENGINEERING PROBLEMS.
Master's thesis,
by Douglas Matthew Clements. 01964, 96p.
Contract AF33 608 1104

Unclassified report

Descriptors: (*Programming (Computers), Civil engineering), (*Civil engineering, Programming (Computers)), (*Geometry, Programming (Computers)), Programming languages, Surveying, Structures, Mechanics, Roads, Bridges

COGO (COordinate GeOmetry) is an open-end programming system oriented to problems in civil engineering. The system consists of three basic divisions, COGO MONITOR, COGO BASIC and COGO PLUG. The monitor is always in memory, as is COGO BASIC. The monitor reads a card or accepts information from the typewriter. It examines the descriptive (command) portion of the record. Monitor then sends control to either a basic routine or a plug for calculation. COGO BASIC is a set of subroutines which perform frequentlyused functions like the storage of known points or the conversion of degrees to radians. COGO PLUG is a set of subroutines each of which is called a plug deck. Each plug deck is used to solve more specialized problems like the area of a polygon or the intersection of two lines. Only one PLUG may be in memory at a time. Simple problems in surveying, structures, and mechanics are presented and solved in this report to show the use of COGO-1. The method for modifying COGO-1 and a modification program are included.

AD-620 431 Div. 13/4
CFSTI Prices: HC $5.00 MF $1.00
TEXAS UNIV AUSTIN
THE DESIGN AND PRODUCTION OF AIR FORCE FAMILY HOUSING.
Master's thesis,
by Ira John Studebaker. 0 May 65, 177p. Contract AF33 608 1121

Unclassified report

Descriptors: (*Housing, Military facilities), (*Military facilities, Design), (*Military personnel, Housing), Civil engineering, Air Force, Construction, Mechanical drawings, Air force procurement

The purpose of this thesis is to identify, explain and understand the problems impeding the homebuilding industry. Specific improvements are suggested. While advocating certain reforms within the industry, the thesis is primarily a study of existing procedures in the production of houses.

AD-620 543 See Fld. 13/10

14/2. LABORATORIES, TEST FACILITIES, AND TEST EQUIPMENT

AD-620 092 Div. 30/6
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
DEVICE FOR CONTROLLING A WIND TUNNEL,
by V. Ya. Mikheev, V. G. Vasilev, M. P. Ryabokon, and V. S. Sukhov. 28 Jun 65, 6p. Rept. no. FTD-TT-65-202
TT , 65-63328

Unclassified report

Unedited rough draft trans. of Russian patent 145921, pub. 13 Jul 60, appl. 673460/25. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Wind tunnels, Control systems), (*Airfoils, Wind tunnel models), Pressure gages, Patents, USSR

The object of the invention is a device for controlling a wind tunnel when investigating models of airfoils, which contains: a control unit for the throttle of the tunnel, a control unit for the change in the angle of incidence of the model, and a control unit for the throttle of the latter, as well as measuring devices of the pressure in the tunnel and in the model and in the angle of turn of the latter. For the purpose of increasing the productive capacity of the tunnel, speeding up the processes of the test, and improving the precision of the results of the measurement, into the indicated units there are programming processes of the test. (Author)

AD-620 093 Div. 30/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
FITTING FOR A THERMOANEMOMETER,
by V. A. Novikov, and V. M. Filippov. 28 Jun 65, 5p. Rept. no. FTD-TT-65-204
TT . 65-63329

Unclassified report

Unedited rough draft trans. of Russian patent 157566, pub. 29 Dec 62, appl. 810867/26-10. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Anemometers, Fittings), Flexible couplings, Patents, USSR

Object of the invention: The fitting of a thermoanemometer for measuring the transverse components of pulsation speed of an air flow designed in the form of a two-filament wire receiver, the distinguishing feature of which is that for the purpose of measuring the transverse components of the speed in mutually perpendicular planes with one and the same receiver in it, the heat of the holder is designed so as to swivel. (Author)

AD-620 094 Div. 30/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
DEVICE FOR MEASURING THE CURRENT GAIN OF TRANSISTORS,
by V. F. Baumgart, A. O. Grundulis, and A. V. Ivans. 29 Jun 65, 6p. Rept. no. FTD-TT-65-206
TT . 65-63330

Unclassified report

Unedited rough draft trans. of Russian patent 164036, pub. 20 Apr 63, appl. 832106/26-9. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Measuring devices (Electrical + electronic), Gain), (*Transistors, Measuring devices (Electrical + electronic)), Transistor amplifiers, Electric currents, Automatic, Circuits, Commutators, Oscillators, USSR, Patents

The object of the invention is a device for measuring current gain of transistors (value for the coefficient of amplification in current of semiconductor triodes) connected in accordance with a system with a grounded emitter which contains a power supply connected up through a resistance to the base and the collector of the transistor being tested and a measurer joined with it of the value for the current of the base with a given value for the collector current. For the purpose of simplifying the automation of the process of measurements as a power supply of the base circuit, there is used a generator of linearly changing voltage, and as a measurer of the current of the base there are connected into the base and collector circuits of the transistor, comparing currents joined with an electronic commutator connected between the output of a frequency-stabilized generator of AC and the input of the counter of the periods of oscillation. (Author)

AD-620 095 Div. 30/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
GAUGE FOR MEASURING CONTINUOUSLY VARYING PRESSURE,
by V. N. Ovchinnikov. 29 Jun 65, 6p. Rept. no. FTD-TT-65-231
TT . 65-63331

Unclassified report

Unedited rough draft trans. of Russian patent 146387, pub. 27 May 61, appl. 732231/40-23.

Descriptors: (*Pressure gages, Automatic), Diaphragms (Mechanics), Generators, Oscillators, Recording systems, Patents, USSR

Object of the invention: A device for measuring continuously varying pressure with a sensitive element designed in the form of a bellows or membrane connected to a string generator (slide-wire oscillator) which has the distinguishing feature that for the purpose of obtaining a linear dependence of the output parameter on the measurable value and continuous recording of the indications on an automatic writing device, in it there is used a feed voltage taken from the output of a string generator (slide-wire oscillator) driving a synchronous electric motor provided with a centrifugal regulator with the arm of which there is connected the pen of the automatic writing device. (Author)

AD-620 111 Div. 30/3 ,8/4
CFSTI Prices: HC $1.00 MF $0.50
LEAR SIEGLER INC GRAND RAPIDS MICH INSTRUMENT DIV
DEVELOPMENT OF EXPERIMENTAL GAS DISCHARGE DISPLAY.
Quarterly progress rept. no. 7, 24 Mar-24 Jun 65. 0 Aug 65, 18p. Rept. no. GRR-65-1083
Contract NObsr89201 Proj. SR0080301 Task 9498

Unclassified report

See also AD-614 922.

Descriptors: (*Gas discharges, Display systems), (*Discharge tubes, Display systems), (*Display systems, Discharge tubes), Panels (Structural), Storage tubes, Photoelectric materials, Electric trigger controls, Circuits, Feasibility studies

Progress is reported on a program is to develop an experimental prototype gas discharge display panel with internal storage capability. The panel will consist of an X-Y matrix of individual gas cells, each of which can be selected and fired by the application of a short triggering pulse. The objectives are to develop a display with high light output, low firing and distribution voltages, and a configuration such that eventual production panels can be fabricated at the lowest possible cost per unit cell. (Author)

AD-620 115 See Fld. 9/5

AD-620 116 See Fld. 9/5

AD-620 127 Div. 30/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
METHOD OF MEASURING THE VISCOSITY OF FLUIDS,
by L. A. Epshteyn. 17 Jun 65, 6p. Rept. no. FTD-TT-65-199
TT . 65-63345

Unclassified report

Unedited rough draft trans. of Russian Patent 156752, pub. 16 Oct 61, appl. 748150/23-4. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Viscosity, Measurement), Attenuation, Bodies of revolution, Liquids, Moment of inertia, Density, Patents, USSR

Object of the invention: A method for measuring the viscosity of liquids in accordance with the attenuation of the rotary oscillations of symmetrical bodies which has the distinguishing characteristic that for the purpose of decreasing the error of the experiment in measuring the viscosity of different liquids, one maintains a constant ratio of the moment of inertia to the density of the liquid. (Author)

AD-620 128 Div. 30/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
AERODYNAMIC SCALES FOR MEASURING SMALL LOADS,
by V. N. Ovchinnikov. 17 Jun 65, 6p. Rept. no. FTD-TT-65-201
TT . 65-63346

Unclassified report

Unedited rough draft trans. of Russian Patent 138401, pub. 24 Sep 60, appl. 680235/40.

Descriptors: (*Balances, Fluid mechanics), Wind tunnels, Patents, USSR

Object of the invention: Aerodynamic scales (windtunnel balance) for measuring small loads including a 'floating' frame suspended on a lever unit, equilibrized by the forces of the electromagnetic interaction of movable and fixed coils, which has the distinguishing feature that for the purpose of assuring high sensitivity and excluding error from the influence of the weight of the model and the movable elements, they are designed in the form of a statically balanced system of lever elements fastened on vertically arranged thread suspensions and provided with a set of coils equalizing the moments formed on the 'floating' frame from the forces of the measuring element and excluding the breaking of the threads of the suspension. (Author)

AD-620 130 Div. 30/3 ,25/7
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
TWO-STAGE MAGNETIC MASS SPECTROMETER FOR THE ANALYSIS OF MINUTE ADMIXTURES,
by V. I. Karataev. 15 Jun 65, 7p. Rept. no. FTD-TT-65-213
TT . 65-63348

Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR. Vestnik, v33 n10 p65-6 1963. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Mass spectroscopy, Mixtures), (*Spectrum analyzers, Mass spectroscopy), Ions, Scattering, Instrumentation, USSR

AD-620 137 Div. 30/4
CFSTI Prices: HC $4.00 MF $2.00
BURNS AND ROE INC NEW YORK
DEVELOPING AND TESTING THE ADVANCED POWER CONVERSION EXPERIMENTAL FACILITY ADVANCED POWER CONVERSION DEVELOPMENT BRANCH UNITED STATES ARMY ENGINEER REACTORS GROUP NUCLEAR POWER FIELD OFFICE FORT BELVOIR, VIRGINIA, VOLUME 2.
Final technical rept. for 1 May 63-30 Jur 65, 30 Jun 65, 110p. Contract DA44 009AMC179X

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Test facilities, Gas turbines), (*Mechanical drawings, Test facilities), Power, Energy conversion, Electric power production

AD-620 139 See Fld. 21/8

AD-620 155 Div. 30/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
DEVICE FOR MEASURING THE INDUCTION OF A PERMANENT MAGNET,
by S. T. Usatenko. 4 Jun 65, 5p. Rept. no. FTD-TT-65-187
TT . 65-63353
Unclassified report

Unedited rough draft trans. of Russian Patent 155541, pub. 2 Jan 62, appl. 758185/26-10.

Descriptors: (*Magnets, Inductance), (*Inductance, Measuring devices (Electrical + electronic)), Hall effect, Magnet coils, Patents, USSR

Object of the invention: A device for measuring the induction of permanent magnets with the aid of Hall's sensitive element which is distinguished by the fact that for the purpose of compensating the effect on Hall's sensitive element of the flux of the magnetizing coils in the circuit of the coils there is placed a shunt the potential terminals of which are included in the circuit of the measuring electrodes of Hall's sensitive element. (Author)

AD-620 157 Div. 30/3 ,8/4
CFSTI Prices: HC $2.00 MF $0.50
NAVAL ORDNANCE LAB WHITE OAK MD
ACCURACY AND CALIBRATION REQUIREMENTS OF OSCILLOSCOPE RECORDING SYSTEMS.
Technical rept.,
by Ronald B. Tussing. 1 Aug 65, 42p. Rept. no. NOL-TR-65-77
Task RUME4E000 2121F008 08
11PA,RRRE51001 2128F008 21 03P A002
Unclassified report

Descriptors: (*Oscilloscopes, Calibration), Underwater explosions, Explosion effects, Pressure, Time, Recording systems, Oscillographs, Errors, Test equipment (Electronics)

The accuracy requirements for oscilloscope systems used to record transient pressures from underwater explosions are investigated. Systems and record reading accuracies are analyzed in detail to establish some basic requirements for calibration accuracies. The requirements are vertical calibration (Q-step), = 0.5 percent; horizontal calibration (time marks), = 0.015 percent. The time of rise and the decay time are defined for the Q-step; graphs and equations are developed for each. Actual experimental arrangements are considered to determine an acceptable range for the internal resistance of the Q-step generator and to show how the limits for the Q-step sweep speed should be found. The specifications for a Q-step generator are given and the merits of several circuits and techniques are discussed. A procedure for reading the Q-step record is included. (Author)

AD-620 158 See Fld. 11/8

AD-620 171 Div. 30/3
CFSTI Prices: HC $2.00 MF $0.50
HARRY DIAMOND LABS WASHINGTON DC
AN ELECTRONIC DESIGN FOR A GENERATING ELECTRIC FIELD-ION CURRENT METER,
by Gordon D. North. 14 Jul 65, 31p. Rept. no. TM-65-36
Proj. HDL-36100 ,DA-1N22901A207
Unclassified report

Descriptors: (*Ionic current, Measuring devices (Electrical + electronic)), (*Electric fields, Measuring devices (Electrical + electronic)), Correlators, Amplifiers, Guided missiles (Surface-to-surface), Electrostatics, Photoelectric effect

The instrument was intended to measure the electrostatic charge history of a ballistic missile throughout its flight. Operation of the system is based on the use of a conducting probe that is alternately exposed to and shielded from an electric field by a motor-driven grounded rotor. The charge induced on the probe develops a voltage that is proportional to the electric field. The original system used a linear response amplifier; it had a limited dynamic range (from a few hundred volts per meter to between 10,000 and 15,000 volts per meter, max), and included no method for separating signals due to collection of ion current from those due to electric field. In the redesign, a dual-channel synchronous demodulator amplifier is used to separate electric field and photoemissive and ion current signals. The field channel uses a logarithmic amplifier that handles 100 to 100,000 v/m. Based on limited test data, the redesigned electronic system is considered suitable for the intended applications. (Author)

AD-620 179 See Fld. 22

AD-620 231 Div. 30/3 ,4/4
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE CAMBRIDGE RESEARCH LABS BEDFORD MASS
DIFFERENTIAL THERMAL ANALYSIS (DTA) OF OXIDE SYSTEMS IN AIR TO 1620C AT ATMOSPHERIC PRESSURE.
Instrumentation papers,
by Cortland O. Dugger. 0 Jun 65, 58p. Rept. no. AFCRL-65-466 ,IP-72
Proj. 5621 Task 5621-01
Unclassified report

Descriptors: (*Oxides, Thermal properties), (*Calorimeters, Design), Heaters, Temperature control, Thermocouples, Recording devices, Operation, Calibration

An apparatus used to perform differential thermal analysis of oxide systems in air at atmospheric pressure to temperatures of 1620C is described. The performance of this apparatus demonstrates excellent reproducibility to within = 3C at 1560C (0.2 percent) for compounds which have been melted, resolidified and melted a second or third time. Such precision has been established partially because of: (a) the recording on the X-axis of the actual temperature of the sample; (b) precise control of a constant rate of heating or cooling of the furnace; and (c) the use of a platinum sample holder which insures that the sample and reference materials experience the same surrounding temperature at the same time. (Author)

AD-620 294 See Fld. 11/8

AD-620 319 See Fld. 6/16

AD-620 322 Div. 30/3
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
A STUDY OF THE INSTABILITY OF NOBLE METAL THERMOCOUPLES IN VACUUM.
Interim rept.,
by B. E. Walker, C. T. Ewing, and R. R. Miller.
10 May 65, 13p. Rept. no. NRL-6236
Proj. ONR RR007 01 46 5400
Unclassified report

Descriptors: (*Thermocouples, Stability), Platinum, Rhodium, Iridium, Platinum alloys, Rhodium alloys, Iridium alloys, High-temperature research, Vacuum, Low-pressure research, Impurities, Iron, Controlled atmospheres, Contamination

Thermoelectric instabilities of noble metal thermocouples and individual thermoelements (platinum, rhodium, iridium, and platinum-rhodium and iridium-rhodium alloys) have been studied in vacuum in the temperature range 800 to 1600C. These studies are an extension of previous work performed in oxidizing and neutral atmospheres. As in that work, the principal source of instability was found to be contamination of the thermoelements by iron impurities from ceramic protection tubes. Iron contamination had a maximum effect on instability in Pt and the alloys but was less important for Ir and Rh. Thermocouple errors associated with this contamination in vacuum were compared with the previous data in air and argon, and the instabilities in vacuum were found to be comparable with those found in argon. The instabilities found for couples in argon and vacuum environments were of much greater magnitude than those found in air. Criteria have been set forth for the use of noble element thermocouples. Important among these are the use of low-iron-content sheathing and large-diameter elements. (Author)

AD-620 383 See Fld. 20/1

AD-620 385 Div. 30/3 ,13/4 ,26/1
CFSTI Prices: HC $3.00 MF $0.75
WYOMING UNIV LARAMIE
CALIBRATION AND STANDARDIZATION OF SMALL ORIFICES IN ONE-INCH PIPE.
Master's thesis,
by Lawrence K. Gottlieb. 0 Aug 65, 81p.
Unclassified report

Descriptors: (*Pipes, Orifices), (*Orifices, Calibration), (*Flowmeters, Pipes), Standardization, Fluid flow, Manufacturing methods, Mechanical engineering

The basic purpose of the report is the calibration and standardization of various size orifices subject to water flow in a one-inch pipe. The standardization is accomplished by the establishment of manufacturing procedures for orifices in order that the established calibration curves can be duplicated.

AD-620 387 Div. 30/6
CFSTI Prices: HC $2.00 MF $0.50
OKLAHOMA UNIV NORMAN
OPERATION OF A DUOPLASMATRON ION ACCELERATOR AS A HIGH ENTHALPY WIND TUNNEL.
Master's thesis,
by William H. Klecker. 01965, 48p. Contract AF33 608 1096
Unclassified report

Descriptors: (*Ion accelerators, Wind tunnels), (*Wind tunnels, Ion accelerators), (*Plasma jets, Wind tunnels), Hypersonic wind tunnels, Operation, Magnetohydrodynamics, Vacuum apparatus, Enthalpy, Ion sources

The purpose of the thesis is to provide future operators of the Duoplasmatron with a general reference which will enable them to maintain the wind tunnel being developed and to adapt it to any particular line of investigation. It also contains a set of procedures by which the tunnel should be operated.

AD-620 449 Div. 30/5 ,20/1 ,9/1 ,9/7
CFSTI Prices: HC $4.00 MF $0.75
MASSACHUSETTS INST OF TECH CAMBRIDGE
GAS DENSITY MEASUREMENT USING SCATTERED GAMMA RADIATION.
Master's thesis,
by Richard Charles Edwards. 0 Jun 65, 114p.
Contract AF33 608 1081
Unclassified report

See also AD-423 150.

Descriptors: (*Gases, Density), (*Density, Gases), (*Gamma ray scattering, Gases), (*Test methods, Density), Air, Compton scattering, Photons, Aluminum, Beryllium, Carbon dioxide

Collimated gamma rays from a Cs137 source were used as a means of determining the density of air (and other gases confined in an aluminum cham-

ber) by measuring the intensity of the photons scattered by the Compton process at 90 degrees to the direction of the incident beam. The chamber was provided with thin 'windows' of beryllium, so that it was possible to study the effects of chamber wall material and thickness. It was found that (1) the count rate was always proportional to the gas density, (2) the experimental error in the net count rate (the difference between the count rate at one atmosphere pressure and the count rate at near vacuum) was 7.3% for chamber entrance and exit windows of 0.50 inch aluminum, and only 3.3% for windows of 0.25 inch beryllium, (3) the presence of the chamber provided scattering material for gamma photons, producing broad peaks at 370 keV, 182 keV, and 125 keV; using the thicker aluminum windows, the response across the entire energy spectrum was larger than in the case of the thinner beryllium windows, and (4) the presence of the chamber had no effect on the size of the sensitive volume. The technique may be used for measurements associated with jet, ramjet, and rocket engine research.

AD-620 457 Div. 30/6 ,25/8
CFSTI Prices: HC $2.00 MF $0.50
ILLINOIS UNIV URBANA
CALORIMETRIC INVESTIGATION OF GAS ENTERING THE NOZZLE OF A LOW-DENSITY HIGH-VELOCITY WIND TUNNEL.
Master's thesis,
by Ronald George Barth. 01965, 40p. Contract AF33 608 1069

Unclassified report

Descriptors: (*Wind tunnels, Thermodynamics), (*Thermodynamics, Nozzle gas flow), Wind tunnel nozzles, Calorimeters, Enthalpy, Stagnation point, Plasma physics

The impetus for conducting a calorimetric investigation of an arc-heater generated flow entering the diverging section of a supersonic nozzle was initiated by construction, at the University of Illinois, of a low-density, hypervelocity wind tunnel, consisting of an arc-heater, stilling chamber, supersonic nozzle, test chamber, adjustable diffuser, and a steam-ejector vacuum pump. All major components of the tunnel were tested separately. A total calorimeter was designed and built to establish by direct measurement the stagnation enthalpy at the nozzle throat.

AD-620 507 **See Fld. 3/1**

AD-620 549 **See Fld. 20/4**

AD-620 566 Div. 30/3 ,25/4
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
A MULTI-RANGE ELECTRONIC APPARATUS FOR MEASURING AND RECORDING PHOSPHORESCENT DECAY.
Interim rept.,
by W. S. Plymale,Jr.. 25 Mar 48, 16p. Rept. no. NRL-3264

Unclassified report

Previously announced 31 Aug 53 as PB-109 574, LC mi$1.75 ph$2.50.

Descriptors: (*Phosphorescence, Measurement), (*Photometers, Phosphorescence), Phototubes, Photomultiplies, Photographic recording systems

The measurement of the decay time and photographic recording of curves showing decay periods of phosphors from 0.0002 second to several hours is made with the apparatus described. Irradiation of the phosphor by ultraviolet light takes place exterior to the apparatus. A 1P22 or a 1P21 multiplier phototube, in connection with a direct-coupled amplifier and a 5-inch oscilloscope tube, gives a sensitivity sufficient to record the brightness as a vertical deflection. Horizontal deflection is produced by a time-sweep circuit triggered by a 1P28 multiplier tube. Another 1P28 tube is used to control the intensity of the spot on the screen, thus preventing overexposure at the starting point when the transient is recorded on film. A time scale is superimposed on the film by setting the vertical gain to zero and introducing a calibrated time pulse into the vertical amplifier during a given sweep. Multi-range time scales, low brightness sensitivity, and the convenience of recording transients are features of the apparatus. (Author)

AD-620 582 **See Fld. 11/7**

AD-620 584 Div. 30/5 ,7/3
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
DEVELOPMENT OF A METHOD OF OBTAINING A UNIFORM ABRASION TEST FOR AIRCRAFT ELECTRICAL CABLE.
by William A. Richie. 3 Feb 48, 15p. Rept. no. NRL-3228

Unclassified report

Previously announced Apr 60 as PB-129 186, LC mi$2.40, ph$3.30.

Descriptors: (*Electric cables, Electric insulation), (*Electric insulation, Test methods), (*Wear resistance, Electric insulation), Aircraft equipment, Tests, Aircraft, Specifications, Failure (Mechanics), Coatings, Abrasives, Test equipment, Physical properties

The trend toward electrical cable without an outer covering of braid over the primary insulation has emphasized the need for a suitable cable abrasion test which will give comparable results on repeated tests, and will be an accelerated test, simple and practical in operation. The investigation to achieve this goal resulted in a machine which meets these requirements, which provides a uniform abrasive surface that will not become clogged with detritus, which automatically stops when the cable's insulation is worn through to the conductor, and which is equipped with a counter for measuring the length of abradant tape necessary to achieve failure of the cable. Results of abrasion tests of cable conducted on this machine indicate a lack of uniformity of the cable protective coating and of concentricity of the cable's insulation. It is believed, however, that sufficient information was secured to provide a basis for an abrasion test to be incorporated in aircraft cable specifications. This test method is not aimed to forecast the service life of the cable; it is intended, rather, to be used as a means of comparing the abrasion resistance of various types of cable insulation. (Author)

AD-620 585 **See Fld. 13/8**

AD-620 613 Div. 30/3 ,25/4
AIR FORCE CAMBRIDGE RESEARCH LABS BEDFORD MASS
A DIRECT CALIBRATION OF A BIREFRINGENT PHOTOMETER.
Instrumentation papers,
by G. J. Hernandez, and E. L. Layman. 9 Feb 65, 9p. Rept. no. AFCRL-65-538 ,IP-74
Proj. 7661 Task 766101

Unclassified report

Pub. in Applied Optics v4 n7 p874-5 Jul 1965 (Copies not available to DDC or Clearinghouse customers). Prepared in cooperation with Northeastern Univ., Boston, Mass.

Descriptors: (*Photometers, Calibration), Refraction, Sky brightness, Upper atmosphere, Light

A technique to calibrate airglow birefringent photometers by means of a mechanically chopped light beam is described. (Author)

AD-620 628 **See Fld. 6/3**

AD-620 649 **See Fld. 12/1**

AD-620 671 Div. 30/3 ,9/1 ,25/8
CFSTI Prices: HC $2.00 MF $0.50
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
AN OPTICAL SYSTEM USING MOIRE' PATTERNS TO OBTAIN QUANTITATIVE DATA IN A BOUNDARY LAYER.
Master's thesis,
by James Maner Tonge. 0 Jun 65, 47p. Rept. no. GAM 65B/ME/65-9

Unclassified report

Descriptors: (*Boundary layer, Optical analysis), (*Flow visualization, Boundary layer), Refractive index, Interference, Temperature, Optical equipment, Thermodynamics

The moire' technique is extended to the measurement of refractive index gradients in air. Moire' bands produced by printers' screens separated by an air space are deviated by an index of refraction gradient. The deviation is shown to be directly proportional to the temperature and density gradients. Temperature gradients are measured along the vertical surface of a heated flat plate and compared with theoretical values. Measured values generally agree with theoretical values within 5%. (Author)

AD-620 713 Div. 30/3 ,25/7
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
FREQUENCY-IMPULSE MODULATION AS A MEANS OF ATTAINING ACCURACY IN CESIUM ATOMIC CLOCKS.
Revised ed.,
by R. S. Badessa, V. J. Bates, and C. L. Searle. 9 Nov 64, 6p. Contract DA36 039AMC03200E

Unclassified report

Pub. in IEEE Transactions on Instrumentation and Measurement v1M13 n4 p175-80 Dec 1964 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 20 Jul 64.

Descriptors: (*Molecular beams, Frequency modulation), (*Atomic clocks, Frequency modulation), (*Cesium, Molecular beams), Phase modulation, Transients, Cavity resonators, Feedback, Radiofrequency, Standards

An electronic system was developed which corrects for cavity-detuning errors in cesium atomic-beam frequency standards. The RF signal applied to the beam tube is square-wave phase modulated, i.e., frequency-impulse modulated. The transient response of the beam tube to these phase steps is used as a control signal. When the positive and negative transients are both equal in area and identical in shape, it will be shown that the applied RF signal must be exactly at cesium frequency (for the given magnetic field) and the RF cavities must be exactly in tune. Two feedback loops are needed; one for correcting the crystal oscillator, the other for adjusting the relative phase of the RF cavities. With cavity detuning error greatly reduced by this system, the remaining source of inaccuracy is the uncertainty of the magnetic field in the drift region of the beam tube. An experiment is described which may permit setting a given cesium-beam standard to a frequency that differs by a precisely known amount from the zero-field cesium-resonance frequency. (Author)

AD-620 769 Div. 30/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
PHOTOELECTRIC DYNAMOMETER FOR TURBOMACHINES,
by V. S. Davydov. 20 Aug 65, 12p. Rept. no. FTD-TT-65-678
TT , 65-63826

Unclassified report

Unedited rough draft trans. of Energomashinostroenie (USSR) v10 n8 p41-3 1964.

Descriptors: (*Dynamometers, Photoelectric cells (Semiconductor), (*Turbines, Dynamometers), Torque, Measurement, Centrifugal compressors, Reliability

A new highly sensitive photoelectric torsion dynamometer was developed for the determination of torque transmitted to the working wheel of a turbocompressor. The photoelectric dynamometer is reliable during long lasting operation and assured high measurement accuracy at low and high rpms (up to 20 000 - 50 000 rpms). (Author)

AD-620 789 Div. 30/3 ,17/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
DEVICE FOR REGISTERING INTERNAL FRICTION IN METALS DURING HEATING,
by A. E. Fedorovskii, and V. N. Bykov. 25 Aug 65, 7p. Rept. no. FTD-TT-65-479
TT , 65-63841

Unclassified report

Unedited rough draft trans. of Russian Patent 161 559, pub. 25 May 62, appl. no. 780952/25-8.

Descriptors: (*Metals, Internal friction), (*Internal friction, Measuring devices (Electrical + electronic)), (*Measuring devices (Electrical + electronic), Internal friction), Heat, Electromagnets, Thermocouples, Patents, Automation, USSR

Object of the Invention: Device for registering internal friction in metals when heated, with the aid of a coordinating registering device, based on auto-excitation of sample vibrations with its natural frequency, having an electromagnet or another vibration exciting device in electrical oscillations proportional to them in amplitude, characterized by the fact, that for the purpose of automating the registration process by maintaining constant vibration amplitude of the sample when changing the magnitude of its internal friction, into the amplifier circuit of the vibration exciter is connected an electron regulator, which serves for controlling the reverse motor, changing the amplification factor of the vibration exciter, into the circuit of which through a thermoconverter is connected one of the measuring systems of the coordinate device. (Author)

14/3. RECORDING DEVICES

AD-620 673 **See Fld. 20/14**

14/5. REPROGRAPHY

AD-620 097 Div. 24/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
METHOD FOR SYNCHRONIZATION OF THE FILM TRANSPORT VELOCITY WITH THE IMAGE VELOCITY IN A SLOTTED AERIAL CAMERA,
by V. B. Kiselev. 27 May 65, 6p. Rept. no. FTD-TT-65-490
TT , 65-63333

Unclassified report

Unedited rough draft trans. of Russian patent 160944, pub. 8 Mar 63, appl. 823849/26-10.

Descriptors: (*Film transport systems, Aerial cameras), (*Aerial cameras, Film transport systems), Camera controls, Image motion compensation, Magnetic materials, Servomechanisms, Photographic equipment, USSR

The method of synchronizing the film transport rate in a slotted aerial camera with the rate of image movement is distinguished by the fact that in order to automatically eliminate the effect of errors in the operation of the transport mechanism of the camera, impulses are recorded on a magnetic track applied to the edge of the aerial film. These impulses are readout by means of magnetic heads and compared in a signal comparison block with signals entering from an image rate sensor (as a function of height and flight speed for each moment of time). A command signal from the comparison block controls the rate of the transport mechanism motor. (Author)

AD-620 148 **See Fld. 6/12**

AD-620 187 Div. 24/2
CFSTI Prices: HC $2.00 MF $0.50
GENERAL ANILINE AND FILM CORP BINGHAMTON N Y PHOTO AND REPRO DIV
PHOTOPOLYMER PRINTER AND PROCESSOR.
Final engineering rept. for May 63-Nov 64,
by C. H. Jacobson. 0 Dec 64, 45p. Contract DA36 039AMC02292E Proj. 1E634401D248 Task 1E6-34401D248 02

Unclassified report

Descriptors: (*Aerial photographs, Photographic processors), (*Photographic printers, Design), (*Photographic processors, Design), Polymers, Photographic film, Lighting equipment, Photographic chemicals, Photographic driers, Construction, Operation

The report covers the design, development, and fabrication of a Photopolymer Printer and a Processor for printing, chopping, processing, and drying positive transparency prints from processed aerial film, in 250-foot lengths by 5 inches wide, by means of a photopolymerization process. The report contains a description of the Photopolymer Printer and Processor, as delivered, and describes the various tests and design considerations in selection of a light source compatible with the characteristics of the polymer material; exposure method; various system resolution tests based on light source, exposure method and interval, and photopolymer materials; processing, washing, and drying methods; and the development of equipment to implement these operations. The report also contains operational theory relating to the use of photopolymer material for making positive transparency prints. The formula for the photopolymer coating, with mixing and coating procedures, is included. (Author)

AD-620 260 Div. 24/2
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
QUANTITATIVE RADIOAUTOGRAPHY USING RADIOACTIVE MONOLAYERS AS STANDARDS.
Research rept.,
by Dietrich E. Beischer. 26 May 50, 10p. Proj. NM-001-059.16.04
NAVMED , NM-001-059.16.04

Unclassified report

Descriptors: (*Autoradiography, Standards), (*Radioactive isotopes, Monomolecular films), Calibration

Quantitative radioautography can be made more accurate by exposing a standard source with multiple intensities for the same time and to the same photographic emulsion as the specimen. The absolute radioactive reference source can be made of several active monolayers. The activity of the specimen in areas as small as 30 microns can be measured by means of a microdensitometer comparing the densities of each specimen's radioautograph with the calibration curve furnished by the standard source. (Author)

AD-620 279 Div. 24/2 ,30/2
CFSTI Prices: HC $3.00 MF $0.75
MITRE CORP BEDFORD MASS
SUMMARY OF EFFORTS EXPENDED ON THE CONCEPT OF 'DYNAMIC UPDATE OF A MICROFILM FILE',
by G. Barboza. 0 Aug 65, 94p. Rept. no. TM-04024
Contract AF19 628 2390 Proj. 614.1
ESD , TR-65-90

Unclassified report

Descriptors: (*Microfilm, Magnetic recording systems), (*Magnetic recording systems, Microfilm), (*Information retrieval, Microfilm), Display systems, Data storage systems, Film readers, Special purpose computers, Command + control systems

A description is given of the hardware developed as a feasibility prototype for a dynamically updatable microfilm information storage, retrieval, and display system. Dynamic updating is accomplished by using a magnetic strip on the microfilm in conjunction with read/write circuits. Data are stored in binary coded decimal format, 32 numerical characters of changeable information or 128 bits to each microfilm image, giving a total magnetic storage capacity of more than 300,000 bits for a 100-foot reel. A variable work length was assigned. A consecutive search capability was built to improve the retrieval response times associated with the forwardonly search technique in commercial reader/retrievers. Consecutive search is defined as the capability to store the present position or frame number location on the film reel and search in either direction (i.e. forward or reverse). Logically, first-stage comparison determines the relative location of a desired frame number with respect to present position along the length of a film reel. If the reel had just been loaded, the contents of the frame counter shift register is zero. For previous requests, the contents of the frame counter shift register will be a direct indication of present position within the film reel. Three possible logical decisions is made as a result of the firststage comparison.

AD-620 373 **See Fld. 3/1**

AD-620 461 Div. 24/2 ,25/4 ,4/4
CFSTI Prices: HC $1.00 MF $0.50
HOLMAN (JOHN F) CO INC WASHINGTON D C
LUMINOFOR BASED ON ZINC SULFIDE AND SENSITIVE TO INFRARED RADIATION,
by Rudolf Hradcovsky. 0 Sep 65, 6p. Contract DA44 009AMC930T Proj. 1 M624201D466
AERDL , T-1800-65

Unclassified report

Luminofor Citlivy na Infracervene Zareni, ha Bazi Sirniku Zinecnateho. Trans. of Czechoslovakin patent 95 316, granted 15 May 60.

Descriptors: (*Luminescence, Zinc compounds), (*Zinc compounds, Luminescence), (*Infrared photography, Photographic materials), (*Photographic materials, Infrared photography), Sulfides, Sensitivity, Infrared radiation, Czechoslovakia, Patents

The luminofor, activated by other metals for photographic registration in the infrared region, is distinguished by the facts that the zinc sulfide is free of deleterious metal impurities exceeding 1,000,000 percent by weight of the zinc sulfide, and is activated by copper, lead or cobalt, none of which may exceed 1,000-10 to the 7th power percent of the zinc sulfide in either the activator or the flux used. This patent covers luminofor, a substance sensitive to infrared radiation in the spectral region up to 2500 microns in which infrared radiation is evidenced by extinction of phosphorescence. (Author)

15/2. CHEMICAL, BIOLOGICAL, AND RADIOLOGICAL WARFARE

AD-620 224 **See Fld. 6/13**

15/3. DEFENSE

AD-620 167 Div. 18/1 ,13/1
CFSTI Prices: HC $2.00 MF $0.50
STANFORD RESEARCH INST MENLO PARK CALIF
DESIGN AND COST STUDY OF HEAT EXCHANGERS FOR AIR-CYCLE SHELTER COOLING SYSTEMS.
Summary rept. for Oct 64-Mar 65,
by John D. Hummell. 10 Mar 65, 40p.
Unclassified report

Sub-contracted to Battelle Memorial Inst., Columbus, Ohio.

Descriptors: (*Cooling + ventilating equipment, Heat exchangers), (*Shelters, Cooling + ventilating equipment), (*Heat exchangers, Feasibility studies), Heat transfer, Pressure, Pipes, Compressors, Costs, Air, Performance (Engineering), Survival, Design, Temperature

Calculations were made to show how the heat transfer and the pressure loss of the heat exchanger and piping would affect the pertinent air-cycle parameters. Appropriate values for heat exchanger characteristics, efficiencies of compressors and expanders, pressure ratios, and air temperature at the expander inlet were used to determine the power, equipment, and heat-sink requirements for an air-cycle system in a shelter. Then, for each of the major components of the system. Cost estimates were made assuming that the compressorexpander costs per cfm would be independent of the pressure ratio and the flow rate.

AD-620 268 **See Fld. 6/9**

AD-620 331 Div. 18/1 ,32/3 ,13/11
CFSTI Prices: HC $2.00 MF $0.50
FEDERAL FIRE COUNCIL WASHINGTON D C
MINUTES OF ANNUAL MEETING, MAY 5, 1965.
01965, 48p.
Unclassified report

Topics presented: Civil Defense's National Fire Coordination Study, by Merle S. Lowden and William S. Moore; Clearinghouse for Federal Scientific and Technical Information, Its Purpose and Function, by Bernard M. Fry.

Descriptors: (*Civil defense systems, Fire safety), (*Fire safety, Civil defense systems), (*Information retrieval, Scientific research), Libraries, Fires

AD-620 741 **See Fld. 13/12**

15/5. LOGISTICS

AD-620 292 Div. 18/3 ,30/2 ,33/1
CFSTI Prices: HC $3.00 MF $0.75
RAND CORP SANTA MONICA CALIF
COMPUTER-ASSISTED MAINTENANCE PLANNING,
by Philip J. Kiviat. 0 Jul 65, 60p. Rept. no. RM-4563-PR
Contract AF49 638 700
Unclassified report

Descriptors: (*Military facilities, Air Force), (*Maintenance, Military facilities), (*Aircraft, Scheduling), Take-off, Landings, Simulation, Strategic air command, Programming (Computers), Logistics

A digital computer was used for maintenance scheduling and planning at a simulated SAC base. The program furnished the base with maintenance plans. Participants, who acted as base managers, used these plans for scheduling and controlling the takeoffs, landings, and maintenance tasks associated with the base flying program. Results with the demonstration program indicate that computer scheduling is a workable idea and can be integrated into normal base planning operations.

15/7. OPERATIONS, STRATEGY, AND TACTICS

AD-620 138 Div. 18/4 ,11/1
CFSTI Prices: HC $4.00 MF $0.75
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS
IMPROVED BEACH MATTING FOR U. S. NAVY AMPHIBIOUS OPERATIONS, ENGINEER TESTS, JANUARY-AUGUST 1964.
Technical rept.,
by S. G. Tucker. 0 Jun 65, 105p. Rept. no. TR-3-680
Unclassified report

Descriptors: (*Amphibious operations, Road-building equipment), (*Road-building equipment, Amphibious operations), (*Beaches, Trafficability), Soil mechanics, Roads, Nets, Wire, Nylon, Plastics, Vehicles, Maneuverability, Naval operations, Military engineering, Civil engineering, Performance (Engineering), Tests

Engineer tests were conducted on three surfacing materials which were placed on an unsurfaced, sloped, sand test area to determine their suitability for improving the trafficability of sand dunes and beaches for wheeled vehicles. The test area was 100 ft long with a 10 percent slope. The materials tested were: (a) woven, 1-1/8-in.-square-mesh nylon netting, (b) woven, 4-in.square-mesh polypropylene cargo netting, and (c) woven wire steel mat. Each was subjected to the simulated traffic and estimated tonnage that would be unloaded from two landing ships, tank (LST's). The nylon netting was inadequate for the volume and tonnage of mixed vehicle traffic unloaded by two LST's, and the woven wire steel mat was too heavy for a crew of six men to place up the 10 percent slope of the test area. The cargo netting was adequate for all traffic and was considered the best of the materials tested. It was recommended that the cargo netting be modified to provide a faster method for connecting ends of sections for placement and to increase the width from 16 to 22 ft. (Author)

AD-620 180 Div. 18/7 ,12/1
CFSTI Prices: HC $2.00 MF $0.50
INSTITUTE FOR DEFENSE ANALYSES ARLINGTON VA ECONOMIC AND POLITICAL STUDIES DIV
BALLISTIC MISSILE DEFENSE AND SOVIET STRATEGY.
Research paper,
by Walter F. Hahn, and Alvin J. Cottrell. 0 Oct 63, 47p. Rept. no. IDA/HQ 64-2939 ,RP-P-140
Unclassified report

Descriptors: (*Guided missiles (Surface-to-surface), Deployment), USSR, Probability, Military strategy, Economics, Decision making, Defense systems

Theoretically, a Soviet anti-ballistic missile (ABM) deployment would be consistent with Soviet military doctrine, Russian-Soviet tradition, and the current military environment in which Soviet strategy must operate. Practically, however, any Soviet ABM decision will be encumbered by a number of constraints-particularly competing demands upon the limited Soviet economy. It is doubtful that the Soviets could move, on a crash basis, into a large-scale ABM development and deployment program without doing serious harm to important domestic, military, and foreign commitments. The 'proximity consciousness' which traditionally has influenced Russian-Soviet strategy may suggest a somewhat limited role for potential ABM deployment; namely, defense against the more modest threat posed by Nth countries of the future (e.g., Western Europe generally, West Germany particularly, and ultimately Communist China). Until now, the Soviets have played their ABM publicity in a markedly low key. Their statements thus far yield no indication of any intent to move into a crash program of extensive ABM deployment. (Author)

AD-620 408 Div. 18/7 ,23/5 ,15/1 ,30/2 ,+
CFSTI Prices: HC $2.00 MF $0.50
GEORGIA INST OF TECH ATLANTA
A MILITARY TACTICAL GAME FOR POSSIBLE USE IN AIR FORCE R. O. T. C. INSTRUCTION: REPORT OF A SPECIAL PROBLEM.
Master's thesis,
by Robert Albert Erickson. 0 Jun 65, 49p. Contract AF33 608 1063
Unclassified report

Descriptors: (*Game theory, Military tactics), (*Military tactics, Game theory), (*Programming (Computers), Air Force training), Air Force personnel, Amphibious operations, Lanchester equations, Education

This game is designed to simulate an amphibious assault against an isolated island objective. Teams of players participate in the game by making a sequence of decisions concerning assault force deployment. These decisions produce a series of simulated battles between assault and defender forces on the island. The outcomes of these encounters are decided by a computer program. The detailed results of these daily battles are furnished to each team as they develop. All teams begin the game with the same number of assault forces at their disposal. Likewise, each team is pitted against the same simulated enemy at the start of the game. However, as the game progresses, the simulated enemy behavior becomes a function of each team's own assault strategy and tactics. Pre-D-Day measures, including aerial and naval bombardment of the target, are considered to have been accomplished. Consequently they are not part of the game. The problem is further simplified by an assumption of force homogeneity, so that the basic moves of the game involve only the commitment of assault forces to discrete geographic positions on the island.

AD-620 439 **See Fld. 4/2**

AD-620 662 Div. 18/4 ,23/5 ,18/5
CFSTI Prices: HC $1.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
RECORDING BATTLE STAFF PERFORMANCE.
Technical memo.,
by William H. Blanchard. 16 Aug 65, 17p. Rept. no. TM-2593/000/00
Unclassified report

Descriptors: (*Military organizations, Warfare), (*Warfare, Management engineering), (*Officer personnel, Decision making), (*Military training, Officer personnel), Armed forces operations, Kill probabilities, Data, Performance (Human), Communication theory, Systems engineering

The report presents material of a general nature on the process of collecting data regarding battle staff performance. The material is intended to serve as a reference in the preparation of lectures or slides. The paper discusses the problem of battle staff data collection and states that the management of an individual air battle is only a minor aspect of the total problem of battle management. Effective data collection for battle staff is more complete and meaningful when longer and more complicated exercises are examined. (Author)

AD-620 777 **See Fld. 12/1**

16. MISSILE TECHNOLOGY

AD-620 152 **See Fld. 18/4**

AD-620 168 **See Fld. 22**

AD-620 179 **See Fld. 22**

AD-620 180 **See Fld. 15/7**

AD-620 335 **See Fld. 11/2**

AD-620 535 See Fld. 20/4

AD-620 672 See Fld. 22

AD-620 677 See Fld. 22

AD-620 691 See Fld. 9/2

AD-620 699 See Fld. 20/4

AD-620 708 See Fld. 3/1

AD-620 728 See Fld. 22

AD-620 759 Div. 12/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
ROCKETS IN THE DEFENSE OF PEACE,
by V. Datsenko, M. Mryakin, and I. Izmailov. 13 Aug 65, 9p. Rept. no. FTD-TT-65-967 TT, 65-63816
Unclassified report

Unedited rough draft trans. of Ogonek (USSR) n25 p4-8 1965.

Descriptors: (*Guided missiles, USSR), Antimissile defense systems

AD-620 806 See Fld. 22

17. NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES

AD-620 344 Div. 12/2 ,1/1
CFSTI Prices: HC $2.00 MF $0.50
MASSACHUSETTS INST OF TECH CAMBRIDGE INSTRUMENTATION LAB
APPLICATION OF MODEL-REFERENCE ADAPTIVE CONTROL TECHNIQUES TO PROVIDE IMPROVED BENDING RESPONSE OF LARGE FLEXIBLE MISSILES,
by Allen Kezer, Lee Gregor Hofmann, and Albert G.Engel,Jr.. 0Jun 61, 43p. Rept. no. E-1042 Contract AF04 647 303 Proj. DSR52 156
Unclassified report

Presented at the Symposium on Ballistic Missile and Aerospace Technology (6th), Los Angeles, Calif., 29-31 Aug 61.

Descriptors: (*Adaptive control systems, Guided missiles), (*Guided missiles, Adaptive control systems), (*Flight control systems, Guided missiles), Flexible structures, Aerospace craft, Deformation, Aerodynamic characteristics, Feedback, Servomechanisms, Model theory

The design of fixed parameter flight control systems which produce acceptable closed loop bending characteristics has become increasingly difficult. This situation may be relieved through the use of an adaptive system which adjusts suitable parameters to achieve the desired performance. Two methods of improving the bending response through the use of model-reference adaptive techniques are presented. One method adjusts a compensation parameter in the flight control system. The second adjusts the effective bending sensed by a pair of rate gyros. The analytical development and the results of analog computer simulation of these systems are presented. (Author)

17/1. ACOUSTIC DETECTION

AD-620 195 Div. 6/1
CFSTI Prices: HC $2.00 MF $0.50
TRACOR INC AUSTIN TEX
AN IMPROVED ANALYTICAL MODEL OF THE INTERACTION OF DOMES AND TRANSDUCERS DURING TRANSMISSION.
Technical memo.,
by W. C. Moyer, J. D. Morell, and Karolen Glass. 31 Aug 65 42p. Rept. no. TRACOR-65-292-U Contract NObsr91229 Proj. SF-00103 Task 8139
Unclassified report

Descriptors: (*Sonar domes, Transducers), (*Transducers, Sonar domes), Mathematical models, Sound transmission, Boundary value problems, Fourier analysis, Elastic shells, Cylindrical bodies

An improvement is described in the specification of transducer velocity distributions which are used in the analysis of dome-transducer interactions. The mathematical model used in these studies consists of a circular cylinder and concentric shell.

AD-620 643 See Fld. 8/10

17/2. COMMUNICATIONS

AD-620 379 See Fld. 9/1

AD-620 467 Div. 5/5 ,8/2
CFSTI Prices: HC $2.00 MF $0.50
NORTH ELECTRIC CO GALION OHIO
STUDY OF AUTOMATIC ROUTING IN A SWITCHED SYSTEM UTILIZING SATURATION SIGNALING.
Quarterly rept. no. 1, 1 Jul-30 Sep 64,
by L. Robinson, H. Hambrock, R. Starr, and S. Sternung. 30 Sep 64, 39p. Contract DA28 043AMC00342E
Unclassified report

Descriptors: (*Telephone communication systems, Switching circuits), (*Switching circuits, Telephone signals), Automatic, Simulation

The areas studied during the past three months are covered. Included are: A sample output from a checkout run of the Signal Saturation simulator, output statistic definitions and program changes presently being incorporated. The matter of priority and pre-emption is discussed with particular emphasis on in-band and out-ofband signaling and trunk reservation. Also included are: discussions of the direct routing simulator, the experimental program, including a method for establishing confidence bounds on the elementary statistics and figures of merit for systems comparison; plus an analysis of the switching speed used. (Author)

AD-620 543 See Fld. 13/10

AD-620 686 Div. 5/5 ,8/2
CFSTI Prices: HC $3.00 MF $0.75
NORTH ELECTRIC CO GALION OHIO
STUDY OF AUTOMATIC ROUTING IN A SWITCHED SYSTEM UTILIZING SATURATION SIGNALING.
Quarterly rept. no. 2, 1 Oct-31 Dec 64,
by L. Robinson, R. Starr, H. Rondina, S. Sternung, and R. Sweet. 15 Apr 65, 55p. Contract DA28 043AMC00342E Proj. DA 1E6 34301D246 02 01
Unclassified report

Descriptors: (*Telephone communication systems, Switching circuits), (*Switching circuits, Telephone signals), Automatic, Data transmission systems

Priority implementation in both saturation signaling and direct routing procedures was studied in detail. Also, reported are the same two priority methods as programmed in the saturation signaling and direct routing simulators. A consideration of character identification codes led to definition of a method for PBX call addressing and a breakdown of internode processing time. The characteristics of a revised message generator program are discussed. An analytical method is elaborated to combine voice and data traffic loads (different holding times) on a link for determining how many trunks the link should have for a given link grade of service. (Author)

17/2.1 RADIO COMMUNICATIONS

AD-620 119 Div. 5/2 ,16/1
CFSTI Prices: HC $1.00 MF $0.50
AIR FORCE ACADEMY COLO
A MODULAR MULTIPLE CHANNEL RADIOTELEMETRY,
by Richard J. Gowen. 01964, 9p.
Unclassified report

Proceedings of the San Diego Symposium for Biomedical Engineering, 1964.

Descriptors: (*Telemeter systems, Medical research), Physiology, Monitors, Data transmission systems, Radio equipment, Multiple operation, Pulse modulation, Modules (Electronic)

A radiotelemetry system designed as a flexible monitoring instrument for use in the investigation of biosensors is described. The modular subassemblies of this telemetry system may be easily combined to yield either single or multichannel telemetry units capable of monitoring physiological variables. Physiological information is telemetered as a change in the pulse rate of a unijunction oscillator. The information pulses gate a radio frequency transmitter, normally a transmitter tunable from 88 to 105 megacycles, which is connected to a special belt antenna. The transmitted signal is received using a commercial receiver. Demodulating, averaging, and amplifying circuits reconstruct the physiological signal for graphic presentation as a strip chart recording on an oscilloscope picture. The telemetry system described is a simple, dependable, and low cost means for the monitoring of physiological variables. (Author)

AD-620 178 Div. 5/2
SYLVANIA ELECTRONIC SYSTEMS WALTHAM MASS
DESIGN, DEVELOPMENT AND ENVIRONMENTAL TEST REPORT ON RADIO SET AN/PRC-63 (XN-1).
Final rept. for Jan 63-Aug 64.
15 Jul 65, 96p. Rept. no. F-150-1
Contract NOw63 0286d
Unclassified report

Available only for reference use at DDC field services. Copy is not available for public sale.

Descriptors: (*Transmitter-receivers, Miniature electronic equipment), Rescue kits, Air-sea rescues, Voice communication systems, Radio beacons, Very high frequency, P band, Design, Batteries + components, Environmental tests, Performance (Engineering), Circuits

The report documents the electrical and microelectronic design, battery development, demonstration tests, and environmental tests conducted on the engineering model of the Radio Set AN/PRC-63 (XN-1). It concludes in summary suggested design changes for improving reliability, maintainability and reduced size and weight. (Author)

AD-620 269 See Fld. 13/9

AD-620 357 Div. 5/2
CFSTI Prices: HC $2.00 MF $0.50
NATIONAL AVIATION FACILITIES EXPERIMENTAL CENTER ATLANTIC CITY NJ
EVALUATION OF VHF AIR-GROUND FIXED-TUNED RECEIVER TYPE RV-13X.
Final rept.,

by James G. Dong. 0 Jun 65, 31p. Proj. 221 110 05V
SRDS, RD-65-80

Unclassified report

Descriptors: (*Radio receivers, Very high frequency), Tests, Air-to-surface, Radio equipment, Cavity resonators

Measurements were made of such operating parameters as; noise figure, sensitivity, selectivity, and desensitization. Based on the results of the evaluation, it was concluded that although the receiver provided an improvement in noise figure and sensitivity at the receiver midband frequency (127 mc), the unit as designed was unsuitable for FAA use due to its susceptibility to undesired responses, instability to provide required selectivity characteristics above the 60 db skirt. It was recommended that the Receiver not be adopted for FAA use.

AD-620 432 Div. 5/2
CFSTI Prices: HC $3.00 MF $0.75
OHIO STATE UNIV COLUMBUS
PHOTOGRAMMETRIC MEASUREMENTS OF ECHO II SATELLITE MODELS.
Master's thesis.
by Forrest Llewellyn Hicks. 01965, 65p. Contract AF33 608 1095 Proj. OSURF1837

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Communication satellites (Passive), Configuration), Inflatable structures, Spheres, Polyester plastics, Aluminum, Radio relay systems, Surface properties, Measurement, Stereoscopic photography, Photogrammetry

Stereoscopic photographs were taken of several models of the Echo II satellite using the Wild Stereometric camera. Large and small scale work was accomplished on the Wild Autograph A7, including contour maps and coordinate readout. Data were processed to achieve final results which included cross sections, radii of curvature, deviations from best-fitting spheres, and distances above a one-meter chord. (Author)

AD-620 567 **See Fld. 9/3**

AD-620 800 **See Fld. 9/1**

17/7. NAVIGATION AND GUIDANCE

AD-620 177 Div. 19/3
CFSTI Prices: HC $4.00 MF $0.75
RITCHIE AND ASSOCIATES INC DAYTON OHIO
DISPLAY PROBLEMS IN INSTRUMENT APPROACH AND LANDING.
Final technical rept.,
by Lewis F. Hanes, and Malcolm L. Ritchie. 0 Jun 65, 105p. Contract AF33 657 7665 Proj. 6190 Task 619008
RTD, TDR-63-4000

Unclassified report

Descriptors: (*Display systems, Flight control systems), (*Approach, Display systems), (*Landings, Display systems), Automatic pilots, Pilots, Flight instruments, Vision, All-weather aviation, Runways

The report contains a summary of two display research efforts. One program is concerned with presentation of information to the pilot while the transition from instrument (IFR) to visual (VFR) flight conditions is made during the final segment of the approach just prior to touchdown. The second program deals with presentation of information to the pilot during the approach and landing when weather conditions preclude visual contact with the runway. The aims of both efforts are (1) identification of major display problems, and (2) recommendations for action by which problem solutions can be obtained. (Author)

AD-620 358 **See Fld. 20/14**

AD-620 359 Div. 19/3, 8/2
CFSTI Prices: HC $1.00 MF $0.50
NATIONAL AVIATION FACILITIES EXPERIMENTAL CENTER ATLANTIC CITY NJ EXPERIMENTATION DIV
HAZELTINE SLATE III AND SLATE III MARK I TRANSPONDERS.
Technical rept.,
by George H. Mahnken, and Paul A. Todd. 0 Jul 65, 19p. Proj. 242 006 01X
SRDS, RD-65-81

Unclassified report

See also AD-600 822.

Descriptors: (*Transponders, Air traffic control systems), (*Radar beacons, Transponders), Tests, Suppressors

A description is given of the transponders, and of the test equipment and procedures used. Only laboratory bench tests were performed. Marginal side lobe suppression and poor echo suppression over the required dynamic range of the receiver were the major deviations. The transponders are considered to be acceptable except for the deviations noted.

AD-620 416 **See Fld. 9/1**

AD-620 417 **See Fld. 9/1**

AD-620 778 Div. 19/4, 26/8
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
GYROSCOPIC HYDRAULIC DEVICE FOR MEASURING ANGULAR VELOCITY AND FOR DETERMINATION OF GEOGRAPHIC LATITUDE.
by L. I. Brozgul. 24 Aug 65, 6p. Rept. no. FTD-TT-65-474
TT, 65-63834

Unclassified report

Unedited rough draft trans of Russian Patent 165 319, pub. 19 Jun 62, appl. no. 783536/26-10.

Descriptors: (*Gyroscopes, Hydraulic systems), (*Hydraulic systems, Gyroscopes), Inertial navigation, Inertial guidance, Fluid mechanics, USSR, Patents

In the proposed gyroscopic hydraulic arrangement an increase in measurement accuracy is attained thanks to the use of a cylinder, provided with radial channels, through which the liquid is forced by two counter streams. The operation of the device is based on the effect of Coroilis forces of inertia on the walls of the tubes, situated along the radii of the cylinder, when the liquid flows through the tubes.

17/9. RADAR DETECTION

AD-620 194 Div. 6/6
CFSTI Prices: HC $1.00 MF $0.50
BOEING SCIENTIFIC RESEARCH LABS SEATTLE WASH
RADAR DETERMINATION OF VELOCITY DATA FROM AN OBSERVATORY SATELLITE.
Mathematical note,
by Sam C. Saunders. 0 Jun 65, 20p. Rept. no. MN-414, D1-82-0447

Unclassified report

Also available from the author.

Descriptors: (*Aerial reconnaissance, Radar tracking), (*Reconnaissance satellites, Moving target indicators), (*Radar tracking, Aerial reconnaissance), Surface targets, Velocity, Radar equipment, Plan position indicators, Detection

We obtain for several geometric situations the expression for the probability of insufficiently accurate data on the velocity of a surface target as a function of the parameters scan rate, nearest approach distance of an observatory satellite, the detection radii of the radar and the probability of detection per scan. The actual number of observations taken per pass of the satellite is random and in one instance we give explicitly the expression of the probability of accurate data. This expectation can be calculated in other cases. This paper allows the determination of the capability of the radar necessary to produce an acceptable probability of obtaining accurate velocity information. (Author)

AD-620 353 Div. 6/6
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
THE DUAL CALSPHERE EXPERIMENT.
Interim rept.,
by R. R. Zirm, R. E. Brescia, and R. S. Rovinski. 30 Jul 65, 14p. Rept. no. NRL-6271
Proj. RT8801 001 652 1S434 00 01

Unclassified report

Descriptors: (*Radar targets, Space surveillance systems), (*Space surveillance systems, Radar targets), Calibration, Satellites (Artificial), Aluminum, Spheres, Radar reflectors, Radar echo areas, Radar range calibrators, Polar orbit trajectories, Radar tracking

Two smooth polished 14-in.-diameter aluminum spheres weighing 2.2 lb and 22 lb have been simultaneously injected into nearly identical 600-naut-mi circular polar orbits. These spheres will provide (a) standard radar targets and (b) observations of the relative change in the orbital parameters with time. Since the scattering cross section of these spheres is less than 0.1 sq ft at 108 Mc, they are not adequate for Space Surveillance System calibration at the present time, although they will be seen more often when system frequency is increased to 216 Mc and transmitter power is increased. They are seen often enough at present, however, so that good orbital elements are obtained from the U.S. Navy Space Surveillance System observations, and it has been possible to identify the light satellite and the heavy one from the relative change in semimajor axis caused by residual atmospheric drag. A density measurement has been obtained from the decrement of the semimajor axis of the light sphere that agrees to within ten percent with the accepted value for the quiet-sun period. (Author)

AD-620 554 **See Fld. 9/3**

AD-620 577 **See Fld. 9/5**

AD-620 761 Div. 6/6, 8/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
METHOD OF INCREASING RESOLVING POWER OF RADAR STATIONS AND A DEVICE FOR ITS ACCOMPLISHMENT,
by Ya. D. Shirman. 9 Aug 65, 6p. Rept. no. FTD-TT-65-963
TT, 65-63818

Unclassified report

Uneidted rough draft Trans. of Patent (USSR) 146 803, appl. no. 461977/40, 25 Jul 56.

Descriptors: (*Resolution, Radar signals), Radar receivers, Radar stations, Delay lines, Filters (Electromagnetic wave), Radar reflections, Patents, USSR

Simplification of the method of increasing radar resolution in the invention being described is achi-

eved by the shortening not of the sounding pulses but the pulses reflected from the target within the receiving device itself by means of a shortening filter in the form of a delay line, the taps to this line being interconnected.

18/4. NUCLEAR INSTRUMENTATION

AD-620 152 Div. 20/6 ,12/1
CFSTI Prices: HC $2.00 MF $0.50
DOUGLAS AIRCRAFT CO INC SANTA MONICA CALIF MISSILE AND SPACE SYSTEMS DIV
COMPUTATIONAL METHODS FOR SPACE RADIATION SHIELDING ANALYSIS,
by M. P. Billings, and R. W. Langley. 0 May 65. 42p. Rept. no. 3525

Unclassified report

Descriptors: (*Shielding, Spacecraft), (*Spacecraft, Shielding), Programming (Computers), Optimization, Transport properties, Electrons, Protons, Dose rate, Space environmental conditions

Analytical methods and computer programs were developed at Douglas for use in establishing the radiation shielding requirements of space vehicle systems. Current techniques for performing space radiation shielding analyses are reviewed in the context of the digital computer programs in which they have been incorporated. Calculations dealing with the transport of primary charged particles and secondary reaction products through matter are performed by the CHARGE program for geometrically simple systems. The calculation of radiation levels in geometrically complex vehicle-shield configurations is accomplished by the SIGMA program, using the QUAD generalized quadratic surface geometry package. Procedures for ascertaining the optimal distribution of shield mass subject to specific dose design criteria are presently under development. (Author)

AD-620 230 Div. 20/6
CFSTI Prices: HC $1.00 MF $0.50
AIR FORCE CAMBRIDGE RESEARCH LABS BEDFORD MASS
FERROUS AMMONIUM SULFATE-CUPRIC CHLORIDE SOLUTIONS FOR DOSIMETRY OF A KILOCURIE COBALT-60 SOURCE.
Physical sciences research papers,
by E. A. Burke, C. M. Jimenez, L. F. Lowe, and M. Mulligan. 0 Jun 65. 21p. Rept. no. AFCRL-65-470 ,PSRP-116
Proj. 5620 Task 562002

Unclassified report

Descriptors: (*Dosimeters, Materials), (*Iron compounds, Radiation chemistry), (*Copper compounds, Radiation chemistry), Ammonium compounds, Sulfates, Chlorides, Oxidation, Spectroscopy, Dose rate, Gamma rays, Sources, Cobalt

Aqueous solutions of ferrous ammonium sulfate with cupric chloride were studied as a means for determining the uniformity of the dose rate around a multikilocurie cylindrical array of cobalt-60. Ferric ion was measured spectrophotometrically at 305 millimicrons. The solution selected to satisfy the requirements for dosimetry contained 0.0005 M ferrous ammonium sulfate and 0.005 M cupric chloride in 0.001 N sulfuric acid. Spectrophotometric measurements of ferric ion were made in solutions brought to 0.15 N acid concentration, instead of the conventional 0.8 N, in order to minimize spurious oxidation. The molar extinction coefficient at this normality proved to be the same as that in 0.8 N solutions. The G value, as compared to the standard ferrous-ferric dosimeter, was 0.65. Using these solutions, no detectable variation in dose rate was found at symmetrically equivalent positions at the center of the cobalt-60 source. The average dose rate at each end of the cylindrical array proved to be 12 percent lower than that at the center. The dose rate was also less uniform at the ends, varying by = 4 percent from point-to-point. At a distance of fifteen inches from the center of the source array, the dose rate decreased as the square of the distance. (Author)

AD-620 267 See Fld. 9/1

AD-620 276 Div. 20/6 ,20/3
CFSTI Prices: HC $1.00 MF $0.50
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
BETA PARTICLE STANDARDS FOR CARBON-14 AND OTHER ELEMENTS IN THE FORM OF RADIOACTIVE MONOLAYERS.
Research rept.,
by Dietrich E. Beischer. 23 May 50. 15p. Proj. NM001 059 16 03
NAVMED . NM-001-059.16-03

Unclassified report

Descriptors: (*Monomolecular films, Radioactive isotopes), (*Beta particles, Standards), (*Radioactive isotopes, Monomolecular films), (*Carbon, Monomolecular films), Radioactivity, Measurement, Biological assay, Dosage, Radiation measurement systems

Monolayers as radioactive sources have the following outstanding qualities: (1) The radioactive atoms are spread completely homogeneously over the emitting surface. (2) The number of active atoms depends only on the area of these layers and on the isotope abundance. (3) Monolayers are 'weightless' sources of 'zero thickness' with insignificant self-absorption. (4) These sources can be made with any desired activity for a number of elements: carbon-14, hydrogen-3, phosphorous-32, and others. They are easily reproducible and relatively permanent. Usage of radioactive monolayers as standards in assay work and for dosage determinations by means of G-M counters and radioautography is recommended. (Author)

AD-620 289 See Fld. 20/8

AD-620 395 Div. 20/6
CFSTI Prices: HC $3.00 MF $0.75
TEXAS A AND M UNIV COLLEGE STATION
PULSE SHAPE DISCRIMINATION CONSIDERATIONS IN A DUAL CRYSTAL GAMMA-RAY SCINTILLATION DETECTOR.
Doctoral thesis,
by Carroll F. Lam. 0 Aug 65. 80p. Contract AF33 608 1120

Unclassified report

Descriptors: (*Gamma-ray spectroscopy, Compton scattering), (*Compton scattering, Pulse discriminators), (*Scintillation counters, Pulse discriminators), (*Pulse discriminators, Gamma-ray spectroscopy), Crystal counters, Sodium compounds, Cesium compounds, Iodides, Tellurium, Photomultipliers, Electromagnetic pulses, Amplifiers, Radioactivation analysis

It is shown that a dual crystal/single photomultiplier scintillation detector system in conjunction with a pulse shape discrimination technique can reduce the entire Compton contribution to a gamma-ray spectrum up to 40%.

AD-620 434 Div. 20/6
CFSTI Prices: HC $3.00 MF $0.75
OHIO STATE UNIV COLUMBUS
THE CONSTRUCTION OF A LITHIUM DRIFTED GERMANIUM SOLID STATE DETECTOR SYSTEM WITH SPECIAL ATTENTION TO AG105 AND IR192.
Master's thesis,
by Robert Allen Dessert. 01965. 72p. Contract AF33 608 1095

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Gamma-ray spectroscopy, Crystal detectors), (*Crystal detectors, Germanium), (*Germanium, Crystal detectors), (*Iridium, Gamma-ray spectra), (*Silver, Gamma-ray spectra), Semiconductor devices, Diodes (Semiconductor), Impurities, Lithium, Radiation damage, Cryostats, Spectrum analyzers

A relatively inexpensive cryostat was constructed for operation of lithium drifted germanium gamma ray detectors at pressures below 0.0000001 mm of Hg and at 77K. Fundamental data was obtained on a Li drifted Ge detector, including relative counting efficiency, resolution and peak to total ratio. The spectra of Ir192 and Ag105 were investigated using the solid state detector. A technique of segmentation and expansion of energy subgroups with a multichannel analyzer is offered as a means to provide more points in a given peak of a spectrum taken on the detector.

AD-620 561 Div. 20/6
CFSTI Prices: HC $2.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
AIRBORNE DUAL-CHANNEL RADIATION DETECTION SYSTEM,
by F. Malcolm Gager, Garold K. Jensen, and Emerson N. Zettle. 25 Aug 48. 29p. Rept. no. NRL-3339

Unclassified report

Declassified 29 Jun 55. Previously announced Apr 60 as PB-129 295. LC mi$2.70, ph$4.80.

Descriptors: (*Radiation detection systems, Airborne), Cosmic rays, Gamma rays, Measurement, Geiger counters, Counting methods, Disk recording systems

The purpose of the system is to detect and record the intensity of radioactivity present in the atmosphere through which the equipment is flown. The system separately and continuously records with time the cosmic or coincident count (C) and the soft gamma or total-minuscoincident count (T-C). It is concluded on the basis of flight use that this equipment is operationally satisfactory and that relatively instantaneous variations in delta (T-C)/(C) serve to detect changes in gamma radiation. Recommendations for further development of this type of detection system are made. More sensitive and reliable GeigerMuller tubes could be used to advantage. Also printed data (numerical) as a function of time could be arranged as a substitute for, or in conjunction with, the inking-type recorders.

AD-620 640 See Fld. 20/8

AD-620 724 Div. 20/6 ,4/2
SINAI HOSPITAL OF BALTIMORE MD BIOCHEMISTRY RESEARCH DIV
THE USE OF SILICONIZED GLASS VIALS IN PREVENTING WALL ADSORPTION OF SOME INORGANIC RADIOACTIVE COMPOUNDS IN LIQUID SCINTILLATION COUNTING,
by C. P. Petroff, P. P. Nair, and D. A. Turner. 28 Oct 63. 5p. Contract Nonr242401

Unclassified report

Pub. in International Journal of Applied Radiation and Isotopes v15 p491-4 1964 (Copies available only to DDC users).

Descriptors: (*Radioactive isotopes, Adsorption), (*Containers, Radioactive isotopes), (*Scintillation counters, Materials), Glass, Silicon compounds, Labeled substances, Calcium compounds, Phosphorus compounds

Serious errors may result in the assay of some inorganic compounds by liquid scintillation counting due to the adsorption of these materials on the walls of glass counting vials. The report deals with the use of siliconized glass counting vials to prevent the 'wall adsorption' of P32 and Ca45-labeled materials. (Author)

18/8. RADIOACTIVITY

AD-620 096 See Fld. 20/6

AD-620 219 Div. 20/3 ,4/2
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE CAMBRIDGE RESEARCH LABS BEDFORD MASS
RADIOCHEMICAL PROCEDURES FOR SELECTED RADIONUCLIDES IN ENVIRONMENTAL SAMPLES.
Instrumentation papers (Scientific rept.),
by Joseph Pecci, Peter J. Drevinsky, Edward Couble, Noreen A. Dimond, and Marvin I. Kalkstein.
0 Jun 65, 73p. Rept. no. AFCRL-65-410, IP-68
Proj. 7690 Task 769001

Unclassified report

Descriptors: (*Radioactive isotopes, Radiochemistry), (*Fission products, Chemical analysis), (*Natural radioactivity, Radiochemistry), (*Radioactive fallout, Chemical analysis), Artificial radioactivity, Cosmic rays, Tracer studies, High altitude, Strontium, Zirconium, Barium, Cerium, Mancanese, Silver, Tungsten, Beryllium, Sodium, Phosphorus, Sulfur, Lead, Chemical precipitation, Samplers, Ion exchange

Methods are presented for the radiochemical analysis of precipitation, air-filter and impactor-filter samples for (1) fission products (Sr89, Sr90, Zr95, Ba140, Ce141, and Ce144), (2) induced radioactivities (Mn54, Ag110, W181, and W185), (3) high-altitude tracers (Rh102 and Cd109), (4) cosmic-ray spallation products (Be7, Na22, P32, P33, and S35), and (5) natural radioactivity (Pb210). (Author)

AD-620 276 **See Fld. 18/4**

AD-620 354 Div. 20/3 ,2/7
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
FILTER PACK TECHNIQUE FOR CLASSIFYING RADIOACTIVE AEROSOLS BY PARTICLE SIZE. PART 3. THE SIZE DISTRIBUTION OF AIRBORNE FISSION PRODUCTS DURING 1963 AND 1964.
Interim rept.,
by L. B. Lockhart,Jr., R. L. Patterson,Jr., and A. W. Saunders,Jr.. 29 Jul 65, 22p. Rept. no. NRL-6305
Contract AT49 7 2435 Proj. RR004 02 42 5151

Unclassified report

See also AD-608 720.

Descriptors: (*Fission products, Atmosphere), (*Aerosols, Radioactive isotopes), (*Radioactivity, Atmosphere), Particle size, Radioactive fallout, Collecting methods, Liquid filters, Paper, Air pollution, Nuclear explosions, Radiochemistry

Some 60-odd collections of radioactive particulate matter dispersed in the atmosphere were during the past two years by use of a filter pack technique utilizing four superimposed filters. The distribution of radioactivity among the filters was analyzed mathematically by means of four simultaneous linear algebraic equations which relate the particle size of the retained material to the filter characteristics so as to permit the assignment of radioactivity in each collection to four major size groupings: 1.1 micron, 0.6 micron, 0.3 micron, and 0.15 micron particle diameter. A comparison of the relative amounts of various long-lived fission products (Ce (144), Pm (147), Sr (90), Cs (137) and of the natural isotope RaD (Pb (210) in month-long collections by four-filter packs shows no significant evidence of fractionation effects among the long-lived fission products. This confirms the importance of the attachment process to the size of radioactive fission product conglomerates detected at ground level. Fresh debris from the Chinese nuclear test, however, exhibited a different isotopic distribution with size than did the older bomb debris. Proportionately more of the shorter-lived radioactive fission products collected during transit of debris from the Chinese test appeared in the largest particle size grouping.

AD-620 572 Div. 20/3 ,14/2 ,14/8 ,17/7 ,+
CFSTI Prices: HC $1.00 MF $0.50
RADIATION EFFECTS INFORMATION CENTER COLUMBUS OHIO
MONTHLY ACCESSION LIST, ABSTRACT NO. 28347 TO 28402, PART I.
List for 1-31 Aug 65.
10 Sep 65, 25p.

Unclassified report

Descriptors: (*Radiation damage, Materials), (*Materials, Radiation damage), Metals, Alloys, Ceramic materials, Organic materials, Polymers, Electronic equipment, Space environmental conditions

Contents: Metallic materials; Ceramic materials; Organic materials; Polymeric materials; Inorganic materials; Electronic materials, compenents, and devices; Facilities; Space environment and effects on materials; Experimental devices and techniques; Miscellaneous.

AD-620 573 Div. 20/3 ,14/2 ,14/8 ,17/7 ,+
CFSTI Prices: HC $1.00 MF $0.50
RADIATION EFFECTS INFORMATION CENTER COLUMBUS OHIO
MONTHLY ACCESSION LIST COORDINATE INDEX: PART II FOR ACCESSION LISTS FROM OCTOBER 1, 1964 TO AUGUST 31, 1965.
10 Sep 65, 15p.

Unclassified report

Descriptors: (*Radiation damage, Materials), (*Materials, Radiation damage), Metals, Alloys, Ceramic materials, Organic materials, Polymers, Electronic equipment, Space environmental conditions

Contents: Coordinate index; Document availability; Radiation environment; Materials, properties, secondary environments, devices, and other coordinate terms.

AD-620 575 **See Fld. 6/8**

AD-620 644 **See Fld. 20/8**

18/9. REACTOR ENGINEERING AND OPERATION

AD-620 149 Div. 20/5 ,15/1
CFSTI Prices: HC $2.00 MF $0.50
DOUGLAS AIRCRAFT CO INC SANTA MONICA CALIF MISSILE AND SPACE SYSTEMS DIV
REACTOR SHIELDING CALCULATIONS BY THE MONTE CARLO METHOD,
by T. M. Jordan. 01965, 27p. Rept. no. douglas paper no. 3271

Unclassified report

Presented at the ANS-ANL-ENEA International Conference on the Application of computing methods to Reactor Problems, 17-19 May 65, Argonne, Ill.

Descriptors: (*Reactor shielding calculations, Monte Carlo method), (*Monte Carlo method, Reactor shielding calculations), Programming (Computers), Neutron flux, Gamma rays, Sampling

Monte Carlo techniques are outlined for the numerical solution of the energy-dependent Boltzmann equation for neutrons or gamma rays, which significantly reduce the computer time required for Monte Carlo shielding calculations. This reduction is a maximum for calculations involving multi-energy source and/or interaction spectra and complicated source, shield, and system geometries. The Monte Carlo techniques include the use of energy independent biasing functions, energy-dependent samples which span the entire energy range of interest, and analytic integrations of the energy dependence of the differential angular-energy interaction cross sections. Typical numerical results obtained from the Douglas Monte Carlo computer program SOBER are presented to demonstrate the accuracy, flexibility and computational speed achieved through the use of these techniques. (Author)

AD-620 650 **See Fld. 10**

AD-620 655 Div. 20/5 ,15/1
CFSTI Prices: HC $2.00 MF $0.50
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
APPLICATION OF DYNAMIC PROGRAMMING TO OPTIMAL SHUTDOWN CONTROL.
Professional paper,
by M. Ash. 27 Aug 65, 27p. Rept. no. SP-2187

Unclassified report

Descriptors: (*Dynamic programming, Reactor shutdown), (*Reactor shutdown, Optimization), (*Xenon, Reactor reactivity), Control, Thermal reactors, Operations research

The digital computer algorithm produced by the methods of dynamic programming, generates optimal reactor shutdown programs that (i) minimize the postshutdown xenon concentration maximum, or that (ii) minimize the xenon concentration itself at a given postshutdown time. Such shutdown programs are found to consist of pulsing the reactor at specified intervals. The number and duration of the pulses depend on the parameters involved, especially the magnitude of the flux constraints, and the constraints on the xenon override reactivity available in a given fuel loading. (Author)

19/1. AMMUNITION, EXPLOSIVES, AND PYROTECHNICS

AD-620 222 Div. 22/1
CFSTI Prices: HC $3.00 MF $0.50
HOLMAN (JOHN F) CO INC WASHINGTON DC
EXPLOSIVE PROPERTIES OF INITIAL EXPLOSIVES: CRYSTALLOGRAPHIC, MOLECULAR, AND QUANTUMCHEMICAL CONSIDERATIONS,
by Akira Suzuki. 0 Aug 65, 58p. Contract DA44 009AMC930T Proj. 1C014501A32B
AERDL . T-1797-65

Unclassified report

Trans. of Kogyo Kayaku Kyokaishi (Japan) v14 n3 p142-63 1953.

Descriptors: (*Explosive initiators, Physical properties), Explosive materials, Synthesis (Chemistry), Sensitivity, Thermal properties, Heat of activation, Ignition, Electric igniters, Crystal structure, Mercury compounds, Fulminates, Quantum mechanics, Molecular structure, Japan

Contents: A historical review of studies on explosive properties of initial explosives; The synthesis and preparation of initial explosives used in the experiment; The impact sensitivity (mainly in low temperature range) of initial explosives; The thermal sensitivity and activation energy of initial explosives; Ignition sensitivity of initial explosives by means of electric bridge current; The impact sensitivity of initial explosives and the secondary structure of their crystals; Analysis of the crystal structure of mercury fulminate; Studies of the properties and explosion mechanism of mercury fulminate based on the image of its crystal; and Quantum-chemical consideration of explosive properties of initial explosives.

AD-620 381 Div. 3/5
CFSTI Prices: HC $2.00 MF $0.50
FRANKFORD ARSENAL PHILADELPHIA PA SMALL CALIBER ENGINEERING DIRECTORATE

DEVELOPMENT OF A WIRE LANYARD TO INCREASE ARMING DISTANCE OF FLARE, AIRCRAFT, PARACHUTE, MK24.
Final rept.,
by A. J. Grandy. 0 Aug 65, 39p. Rept. no. R-1772
Unclassified report

Descriptors: (*Arming devices, Aircraft flares), (*Aircraft flares, Arming devices), Wire, Parachutes, Helicopters, Illumination, Military tactics, Coils, Winding, Torque, Packaging, Drop testing

The Mk 24 Aircraft Flare is used for illumination of battle areas during tactical night situations and can be launched from the interior or exterior of fixed or rotary wing aircraft. Erratic performance of the fuze arming train in the flare has dictated a need to increase the arming distance especially when the flare is manually launched from helicopters. The object of this program was to develop a small, lightweight wire package that could be easily attached to the flare. The package would provide a 50-foot arming distance prior to actuation of the fuze train. Originally, a spool of high strength steel wire with 'torque' induced windings was considered for the application. A torque induced winding is one where a torsional energy is introduced to the wire during the winding process. During payout the wire will thus be free of stresses normally resulting from the uncoiling of the wire. (Author)

19/4. EXPLOSIONS, BALLISTICS, AND ARMOR

AD-620 763 Div. 22/6 ,9/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
ANALOGY BETWEEN CYLINDRICAL EXPLOSION AND HYPERSONIC GAS FLOW PAST BODIES,
by V. P. Korobenynikob. 10 Aug 65, 13p. Rept. no. FTD-TT-65-981
TT , 65-63820
Unclassified report

Unedited rough draft trans. of Zhurnal Prikladnoi Mekhaniki i Tekhnicheskoi Fiziki (USSR) n6 p45-9 1962.

Descriptors: (*Explosions, Gas flow), (*Hypersonic flow, Gas flow), Cylindrical bodies, Blunt bodies, Aerodynamic characteristics, Shock waves, Blast, USSR

It is well known that the results of solution to the problem of cylindrical point explosion in a gas may be used to approximately determine a number of characteristics of flow during stationary hypersonic flow past thin blunt bodies. A comparison of the results of explosion theory has been carried out previously taking into account the problem of flow past a blunt cylinder for the case of a self-similar explosion without considering back pressure or with a linearized problem concerning explosion taking account back pressure. An approximate method is presented for determining the law of motion of a shock wave and pressure at the explosion center; a comparison is made of these calculations with those made in flow past problems. (Author)

19/5. FIRE CONTROL AND BOMBING SYSTEMS

AD-620 233 Div. 22/7 ,26/8
CFSTI Prices: HC $3.00 MF $0.75
NAVAL ORDNANCE TEST STATION CHINA LAKE CALIF
DIRECT DIGITAL CONTROL OF VARIABLE-SPEED HYDRAULIC TRANSMISSION.
Report for Jul 64-Jan 65,
by G. E. Kovalenko. 0 May 65, 74p. Rept. no. NOTS-TP-3822
Task RMWC-21-113/216-1/F009-04-04
Unclassified report

Descriptors: (*Fire control system components, Control systems), (*Variable-speed drives, Hydraulic systems), (*Control systems, Variable-speed drives), (*Hydraulic actuators, Fire control system components), Transmissions, Digital systems, Orifices, Control panels, Hydraulic pressure pumps, Electric motors, Shipborne, Digital computers

The report documents a test in which a digital orifice test panel was used with a 7020 hydraulic power drive to study the open - loop response. The 7020 is a typical Fleet-used gun and launcher drive unit; the digital orifice panel is an absolute - value and sign-flow control device that accepts binary digital commands and is used to control the output of the variable-displacement pump and fixeddisplacement motor of a hydraulic transmission. The test was conducted to establish the capacity and further the study of digital hydraulic controllers. The digital orifice used in the test was a breadboard panel. (Author)

AD-620 578 Div. 22/7
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
AN AUTOMATIC SCORING DEVICE FOR GUN FIRE CONTROL SYSTEMS MARK 57 AND MARK 63,
by H. P. Birmingham, and R. S. Sackett. 0 Jun 47, 11p. Rept. no. NRL-3098
Unclassified report

Previously announced 13 Jan 53 as PB-107 865, LC mi$1.25, ph$1.25.

Descriptors: (*Fire control systems, Radar tracking), Fire control system components, Radar equipment, Tracking, Timing devices, Clocks, Recording systems, Automatic

A device is described which is designed for use in evaluating the performance of pointers in tracking by radar with the Gun Fire Control Systems Mark 57 and Mark 63. The device receives information from the pointing-error channels of the radar, and after modifying this information, utilizes it to provide a measure of tracking accuracy through the use of timing clocks. The limitations of other methods of evaluating this kind of tracking, such as by optical checksighting or by use of the kymograph, are discussed in the appendix. (Author)

AD-620 581 Div. 22/7 ,30/2
CFSTI Prices: HC $3.00 MF $0.75
NAVAL RESEARCH LAB WASHINGTON DC
THE RELAY INTERPOLATOR, A DESCRIPTION OF ITS OPERATION,
by B. L. Sarahan. 25 Sep 47, 83p. Rept. no. NRL-3177
Unclassified report

Previously announced Apr 60 as PB-130 104, LC mi$4.80, ph$13.80.

Descriptors: (*Fire control computers, Computer logic), (*Digital computers, Fire control systems), (*Teletype systems, Fire control systems), Antiaircraft fire control systems, Firing-error indicators, Test equipment, Relays, Electrical engineering

The Relay Interpolator is a digital-type relay calculating machine. Upon the reception of proper instructions from a control unit, it is capable of performing certain computational processes automatically and recording the numerical results on a standard teletype printer. Relay circuits are provided so that the numerical results may be translated into special codes and perforated on standard teletype tape. The primary purpose of the Relay Interpolator is to prepare tapes for the various Tape Dynamic Testers which were developed to aid in the evaluation of gun fire control equipment. This report gives a description of the mathematical operations performed by the Relay Interpolator and indicates the basic principles involved in its design. Detailed descriptions of each circuit are included in an appendix for the benefit of those working with the machine. Additional appendixes deal with the mathematics of sub-tabulation as applied to the requirements of the Tape Dynamic Testers. (Author)

AD-620 590 Div. 22/7
CFSTI Prices: HC $2.00 MF $0.50
ARMY ELECTRONICS COMMAND FORT MONMOUTH NJ
BATTERY DISPLAY UNIT (FEASIBILITY MODEL).
Technical rept.,
by Seth L. Everett,Jr., and Robert A. Cicero. 0 Jun 65, 44p. Rept. no. ECOM-2601
Proj. 1P0 20401A327 Task 1P0 20401A32702,1P0 20401A3270211
Unclassified report

Descriptors: (*Artillery units, Fire control computers), (*Fire control computers, Display systems), Feasibility studies, Models (Simulations), Decision making, Computer logic, Decoding, Meteorological parameters, Input-output devices

The report deals with the design and fabrication of a laboratory constructed breadboard model Battery Display Unit (BDU). A short history discussing the requirements and a past attempt to produce a display unit similar to the BDU is included. The bdu system design concept permits it to receive and display data at speeds approaching that of the logic decoding circuits. Information reception at rates well in excess of those required is easily obtainable. The operating principles of the electromagnetic indicators used in the BDU are described. These principles offer important operating advantages with respect to the BDU application. General BDU operation theory and detailed logic circuit design information are included. Excellent test results were obtained when operating the BDU at the required 300 characters/second input data rate. Excellent results were also observed when operating the BDU at lower data rates. This report is concluded by comparing the operating characteristics of the BDU with that of the existing FADU model. Recommendations are made concerning further improvements and uses of the BDU. Character coding used in the BDU is described. (Author)

19/6. GUNS

AD-620 737 Div. 22/8 ,1/9
CFSTI Prices: HC $3.00 MF $0.75
SPRINGFIELD ARMORY MASS
NOTES ON DEVELOPMENT TYPE MATERIEL FOR THE ARMAMENT SYBSYSTEM, HELICOPTER, 7.62MM MACHINE GUN, TWIN XM2, FOR USE ON H-13E, H13G, AND H-13H ARMY HELICOPTERS.
Rept. on XM2 helicopter armament kit system,
by Francis F. Cabana. 1 Aug 62, 58p. Rept. no. SA-NM20-9208
Proj. OCMS 5110 22 01203 03
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Automatic weapons, Aircraft guns), (*Aircraft guns, Helicopters), (*Helicopters, Aircraft guns), Army aircraft, Small arms, Instruction manuals, Maintenance, Operation

The notes are published to provide the using arms and ordnance maintenance personnel with information and guidance for the proper handling, installation, operation, and maintenance of the Armament Subsystem, Helicopter, 7.62mm Machine Gun, Twin XM2. The primary purpose of the Armament Subsystem Twin XM2 is to provide inflight capability of the H-13 helicopter to suppress enemy ground fire. This kit can also be used for other air-toground firing situations.

20/1. ACOUSTICS

AD-620 338 See Fld. 20/4

AD-620 382 Div. 25/1 ,2/9
CFSTI Prices: HC $2.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
COMPARISON OF CONVERGENCE-ZONE-MEASURED SOUND PRESSURES IN THE DEEP OCEAN WITH PRESSURES COMPUTED FROM THE SOUND SPEEDDEPTH FUNCTION.
Interim rept.,
by R. L. Steinberger. 5 Aug 65, 29p. Rept. no. NRL-6269
Proj. RF101 03 45 5250
Unclassified report

Descriptors: (*Sound transmission, Underwater sound), (*Underwater sound, Sound transmission), (*Acoustics, Underwater sound), Atlantic Ocean, Mechanical waves, Refraction, Reflection, Pressure, Propagation, Geometry, Marine geophysics

This report is a sequel to an earlier report (AD-606 391) in which the sound speed c was determined as a function of the depth z in deep-ocean waters north of Puerto Rico. Computational methods were also developed and used to obtain numerical values for the horizontal range between the sound source and the zone where the emitted acoustic waves converge to give signal (pressure) enhancement. The present report is concerned with computing the detailed distribution of sound pressure, by means of ray diagrams and field measurements, in the zone. On the basis of simple wave theory, convergence zone ranges and pressure values are derived from the c (z) function for three basic ray fans which overlap at the zone. It is found that both the horizontal range determinations (from 64.34 to about 70 km) and the acoustic pressure values within the zone agree favorably with measured values. By utilizing deep-ocean measurements, the resultant acoustic pressures were free of confusion from bottom scattering and the complexity of many refraction paths. (Author)

AD-620 383 Div. 25/1 ,30/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON DC
A METHOD FOR EVALUATING TRANSDUCER LOADING EFFECTS ON ULTRASONIC TRANSIT TIME MEASUREMENTS.
Interim rept.,
by E. W. Kammer. 2 Aug 65, 11p. Rept. no. NRL-6273
Proj. SR007 10 04 0891 ,RR009 03 45 5754
Unclassified report

Descriptors: (*Ultrasonic radiation, Non-destructive testing), (*Non-destructive testing, Stresses), (*Transducers, Loading (Mechanics)), Ultrasonic properties, Structures, Sound transmission, Velocity, Oscillators

Measurements of ultrasonic pulse velocities in specimens of structural materials offers a means of nondestructive stress analysis. An ultrasonic measurement technique and data processing scheme has been devised in which time intervals are measured between transducer resonance oscillations within the structure of successive unrectified echoes of an initial square-wave pulse rather than between echo leading edges. When the echo round trip transit times obtained using a series of transducers of different thicknesses are plotted against the transducer resonance periods, these time intervals determine a straight line. Actually, the data processing method yields several equally spaced values, one of which is the echo transit time while the others differ from it in steps of one cycle period of the resonant transducer vibrations which form the pulses. The result is a family of straight lines which have a single point in common at zero transducer resonance period. It is proposed that the transit time associated with this common point is the true travel time for sound in the medium unperturbed by transducer effects. (Author)

AD-620 479 Div. 25/1 ,9/1
CALIFORNIA UNIV BERKELEY DEPT OF PHYSICS
SCATTERING OF SOUND BY A CLASSICAL VORTEX,
by Alexander L. Fetter. 20 Jul 64, 8p. Contract AF AFOSR130 63 Proj. 9767 Task 976701
AFOSR , 65-1111
Unclassified report

Pub. in Physical Review v136 n6A pA1488-93 Dec 14 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Sound signals, Scattering), (*Vortices, Sound transmission), Hydrodynamics, Acoustics, Perturbation theory, Partial differential equations, Helium, Liquefied gases

The cross section for the scattering of sound by a vortex is calculated using the linearized equations of classical hydrodynamics. With a circulation K, the differential cross section in the long-wavelength limit is 1/2 pi (K/2c pi)-sq h (sin phi)-sq 1/ (1-cos phi)-sq, where c is the speed of sound. Possible experimental verification is suggested with particular reference to liquid He II. (Author)

AD-620 532 Div. 25/1 ,9/1
VERMONT UNIV BURLINGTON DEPT OF PHYSICS
PARAMETRICALLY EXCITED SURFACE WAVES,
by R. P. Brand, and Wesley L. Nyborg. 9 Jan 64, 9p. Contract AF AFOSR62 63 Proj. 9767
Task 976702
AFOSR , 65-1104
Unclassified report

Pub. in Journal of the Acoustical Society of America, v37 n3 p509-15 Mar 1965. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Mechanical waves, Liquids), (*Liquids, Acoustic properties), Boundary layer, Oscillation, Damping, Ultrasonic properties, Surface properties

Experimental results are given on waves established at the upper surface of liquid in a rectantular Plexiglas vessel executing uniform vertical oscillation, with frequencies primarily in the range 50-500 cps. Comparison is made with theory originally given by Benjamin and Ursell, extended by Sorokin and Eisenmenger. Observed wave frequencies (one-half the excitation frequency) and wavelengths are in reasonable agreement with this theory, but observed values of the critical onset amplitude A are much greater than expected. Considerable, though insufficient, improvement results from modifying the theory so that acoustic boundary layers at the container walls are taken into account. Using this modified theory, the ratio of observed to predicted A is as much as 14 at low frequency, but decreases to about 2 at the upper frequency limit. It is suggested that the discrepancy may arise, at least in part, from time-dependent solid-liquid surface energy, the time-dependence resulting from oscillation of the meniscus at vessel walls. (Author)

AD-620 697 Div. 25/1
CFSTI Prices: HC $2.00 MF $0.50
WESTERN RESERVE UNIV CLEVELAND OHIO ULTRASONICS RESEARCH LAB
ULTRASONIC STUDIES OF ELECTROLYTES.
Technical rept.,
by Ernest Yeager. 1 Aug 65, 41p. Rept. no. TR-28
Contract Nonr143904 Proj. NR384 305
Unclassified report

Descriptors: (*Electrolytes, Ultrasonic properties), (*Ultrasonic properties, Electrolytes), Solutions, Sound transmission, Transport properties, Electrical properties, Relaxation time, Vibration, Colloids

Important developments which have occurred in the application of ultrasonic techniques to the study of the structure and dynamic properties of electrolytic solutions during recent years are discussed with principal emphasis on ultrasonic relaxation and electrical effects attending the propagation of sound waves through such solutions. Sufficient understanding of the various relaxation processes in electrolytic solutions now has been attained that the relaxation frequencies and excess relaxation absorption can often be predicted in advance of ultrasonic measurements from other data. In contrast measurements of the electrical effects, particularly ionic vibration potentials, are still rather uncertain because of the possible superposition of several acoustical effects, and measurements of really quantitative significance are only now becoming available for the most part. (Author)

AD-620 749 Div. 25/1
CFSTI Prices: HC $1.00 MF $0.50
CASE INST OF TECH CLEVELAND OHIO DEPT OF PHYSICS
THE POLARIZATION OF ACOUSTIC WAVES IN CUBIC CRYSTALS.
Technical rept.,
by A. E. Fein, and Charles S. Smith. 0 Jul 52, 8p.
Rept. no. TR-10
Contract N6onr27303 Proj. NR019 201
Unclassified report

Descriptors: (*Ultrasonic radiation, Crystals), (*Crystals, Ultrasonic radiation), Polarization, Propagation, Graphics, Single crystals, Nickel, Symmetry (Crystallography), Partial differential equations, Sound transmission

The directions of particle motion associated with acoustic waves have been computed and are displayed graphically, for each of the three waves, as a function of propagation direction. The numerical example used is cubic nickel and the maximum polarization angle found is 11 1/2 degrees. (Author)

20/2. CRYSTALLOGRAPHY

AD-620 101 Div. 25/2 ,25/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
CRYSTALLIZATION OF SOLUTIONS UNDER THE EFFECT OF A HIGH VOLTAGE PULSE DISCHARGE,
by D. E. Glavatskii, A. V. Kortnev, and A. N. Kutsenko. 15 Jun 65, 7p. Rept. no. FTD-TT-64-1177
TT , 65-63337
Unclassified report

Unedited rough draft trans. of Izvestiya Uchebnykh Zavedenii. Fizika (USSR) n2 p147-8 1964.

Descriptors: (*Crystallization, Dibasic acids), (*Electric discharges, Crystallization), Crystal growth, Capacitors, Voltage, USSR

The effect was investigated of a high voltage condensed spark discharge on the kinetics of crystallization of supersaturated aqueous solutions of tartaric acid.

AD-620 112 See Fld. 20/12

AD-620 188 See Fld. 11/6

AD-620 238 See Fld. 11/6

AD-620 241 See Fld. 11/6

AD-620 264 See Fld. 11/6

AD-620 424 See Fld. 7/4

AD-620 437 Div. 25/2
CFSTI Prices: HC $1.00 MF $0.50
GEORGIA INST OF TECH ATLANTA ENGINEERING EXPERIMENT STATION
X-RAY DIFFRACTION STUDIES OF THERMAL MOTIONS IN CRYSTALS.
Quarterly progress rept. no. 24, 1 Mar-31 May 65,
by R. A. Young. 8 Jul 65, 6p. Contract Nonr99100 ,Nonr99106 Proj. NR017 623 A389

Unclassified report

Descriptors: (*X-ray diffraction analysis, Reports), Crystals, Thermal properties, Motion, Crystal lattice defects

Research on x-ray diffraction studies of thermal motions in crystals is summarized.

AD-620 443 See Fld. 20/12

AD-620 477 Div. 25/2 ,25/6 ,4/4
CORNELL UNIV ITHACA N Y DEPT OF CHEMISTRY
OCCUPATION PROBABILITIES IN THE LATTICE GAS,
by J. M. J. Van Leeuwen. 9 Jul 64, 7p. Contract AF AFOSR324 63 Proj. 9767 Task 976701 AFOSR , 65-1116

Unclassified report

Pub. in Journal of Chemical Physics v41 n10 p2959-62 Nov 15 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Crystal lattices, Probability), Crystal substructure, Quantum mechanics, Thermodynamics, Functions

A set of relations obtained by Widom for the probabilities fr that an empty cell is surrounded by r filled cells is rederived and extended. The consequences of the relations for the partition function, the correlation functions, and partially coupled systems are discussed. (Author)

AD-620 521 Div. 25/2 ,17/2
MASSACHUSETTS INST OF TECH CAMBRIDGE METALS PROCESSING LAB
DUCTILE FRACTURE IN COPPER SINGLE CRYSTALS.
Revised ed.,
by S. Saimoto, W. F. Hosford,Jr., and W. A. Backofen. 20 Apr 65, 15p.
NRC , 8605

Unclassified report

Research supported by Atomic Energy Commission, Washington, D. C. Pub. in Philosophical Magazine v12 n116 p319-33 Aug 1965 (Copies available only to DDC users). Revision of manuscript submitted 14 Aug 64.

Descriptors: (*Copper, Fracture (Mechanics)), (*Single crystals, Copper), Ductility, Deformation, Shear stresses, Rupture, Crystal lattices

Metallographic and x-ray studies in the vicinity of the necks of fractured copper single crystals oriented for multiple slip have shown that initial necking takes place by general deformation followed by localized shearing after a well-developed neck has formed. Lattice rotation was observed to occur in the necked region during general deformation; void growth and quadrangular cavity formation, during localized shear process.

AD-620 589 See Fld. 11/6

AD-620 623 See Fld. 20/12

AD-620 679 See Fld. 11/6

AD-620 707 Div. 25/2 ,25/6
OKLAHOMA UNIV RESEARCH INST NORMAN
HIGH-TEMPERATURE MAGNETIC SUSCEPTIBILITIES AND TRIGONAL-FIELD SPLITTING OF VANADIUMDOPED CORUNDUM CRYSTALS.
Technical rept.,
by Chun C. Lin, E. C. Segraves, and William H.Brumage. 11 Jan 65, 4p. Rept. no. TR-14 Contract Nonr98207 Proj. NR014 109

Unclassified report

Pub. in Journal of Chemical Physics, v42 n9 p3326-7 May 1 1965. (Copies not available to DDC or Clearinghouse customers). Prepared in cooperation with Louisiana Polytechnic Inst., Ruston. Dept. of Physics.

Descriptors: (*Symmetry (Crystallography), Corundum), (*Corundum, Magnetic properties), High-temperature research, Vanadium, Crystal lattice defects

Magnetic behavior at high temperatures was studied to make a more direct determination of the trigonal-field splitting of the ground 3T1 state of V (3+) in corundum.

AD-620 732 See Fld. 20/8

AD-620 733 See Fld. 20/12

AD-620 740 Div. 25/2
CFSTI Prices: HC $6.00 MF $1.25
CRUFT LAB HARVARD UNIV CAMBRIDGE MASS
CHARACTERISTICS OF LOCALIZED DOMAINS IN FERROELECTRIC CRYSTALS.
Scientific rept.,
by Mahmoud M. Shabana. 5 May 65, 212p. Rept. no. SR-4 (series 3)
Contract AF19 628 3874 Proj. 5635 Task 563503
AFCRL , 65-506

Unclassified report

Descriptors: (*Ferroelectric crystals, Grain boundaries), (*Crystal structure, Ferroelectric crystals), Barium compounds, Titanates, Optical properties, Surface properties, Symmetry (Crystallography), Field theory, Polarization, Single crystals, Computer logic

The characteristics of localized domains in a-domain and c-domain single crystals of barium titanate were investigated. Experimentally, the domains have been optically observed with a polarizing microscope. The domains and the surrounding strain patterns are manifested by regions of different optical retardation. The genuine behavior of the localized domains may be understood in terms of a localized stress model. The characteristics of localized domains make them useful in optical devices such as optical gates and storage elements.

AD-620 755 Div. 25/2 ,4/3
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF PURE PHYSICS
THE CRYSTAL STRUCTURE OF THE AZULENE, S-TRINITROBENZENE COMPLEX,
by A. W. Hanson. 9 Nov 64, 8p. Rept. no. NRC-8531

Unclassified report

Pub. in Acta Crystallographica v19 pt1 p19-26 Jul 1965 (Copies available only to DDC users).

Descriptors: (*Complex compounds, Crystal structure), (*Nitrobenzenes, Complex compounds), (*Polycyclic compounds, Complex compounds), Chemical bonds, Molecular structure, Molecular association, Canada

The crystal is monoclinic P2 (1)/a, with Z=4. Unit-cell constants at -95C are a=16.39, b=6.66, c=13.77A, Beta= 96.10 degrees. The formula is C10H8,C6H3N3O6. The structure was determined from the three-dimensional Patterson synthesis, and refined by least-squares procedures. The structure is disordered, with about 7% of the azulene molecules adopting an alternative orientation, but this disorder did not seriously limit the accuracy of the analysis. The azulene molecule is nearly planar, but the s-trinitrobenzene molecule is not. The NO2 groups are twisted out of the plane of the benzene nucleus by amounts which vary, and which are probably determined by molecular environment. The constituent molecules overlap each other with an average interplanar spacing of 3.33A, but two C-N contacts are found to have lengths of 3.30A. (Author)

20/3. ELECTRICITY AND MAGNETISM

AD-620 101 See Fld. 20/2

AD-620 189 See Fld. 20/12

AD-620 223 Div. 25/3
CFSTI Prices: HC $2.00 MF $0.50
AEROJET-GENERAL NUCLEONICS SAN RAMON CALIF
RESEARCH ON VOLTAGE GRADIENTS FROM ELECTRONACOUSTICAL WAVES.
Final technical rept.,
by C. B. Kretschmer. 0 Mar 65, 35p. Rept. no. AN-1398
Contract AF49 638 1347 Proj. 9752 Task 975201
AFOSR , 65-1044

Unclassified report

Descriptors: (*Plasma oscillations, Voltage), (*Acoustics, Plasma medium), Electric arcs, Argon, Electrons, Temperature, Density, Electrical conductance, Cyclotron waves, Microwaves, Ultraviolet radiation, Line spectrum, Gas ionization

Experimental work was conducted on an energetic argonfed hollow cathode arc. The arc column had a diameter of 1.27 cm and a length of 60 cm. Microwave interferometer measurements at 1.20 x 10 to the 11th power cps gave a plasma density of 1.8 x 10 to the 14th power electrons/cu cm, and spectroscopic line intensity measurements yielded an electron temperature of 1.1 ev. The voltage gradient along the arc was less than 0.1 v/cm. Since a voltage gradient of 10 to 20 v/cm would be required to produce current densities of the observed magnitude in a plasma with an electron temperature of 1.1 ev by ordinary conduction, it is believed that the arc current is carried by electrons which are trapped in electron plasma waves and accelerated to high velocity by the waves. Attempts to detect radiation emitted by the plasma at the electron plasma frequency gave inconclusive results. Strong signals were detected at frequencies below 500 kc. The arc column was found to radiate as much as 73% of the input power in the vacuum ultraviolet region between 400 A and 1000 A, with a large fraction concentrated between 430 A and 540 A. Many lines of singly through quadruply ionized argon were identified. Doubly ionized argon appeared to be the most abundant species.

AD-620 229 Div. 25/3
CFSTI Prices: HC $2.00 MF $0.50
AIR FORCE CAMBRIDGE RESEARCH LABS BEDFORD MASS
DISTORTION OF A MAGNETIC FIELD BY THE MOTION OF A CYLINDRICAL CONDUCTOR.
Physical sciences research papers,
by Joseph G. Kelley, and Ronald S. Finn. 0 Jun 65, 29p. Rept. no. AFCRL-65-440 ,PSRP-114 Proj. 8608 Task 860801

Unclassified report

Descriptors: (*Magnetic fields, Distortion), (*Cylindrical bodies, Electrical conductance), Motion, Partial differential equations, Field theory, Potential theory, Series, Perturbation theory

Motion of a conductor relative to a magnetic field distorts the field. This paper considers a cylindrical slug moving in a two-dimensional magnetic

field, represented by the vector potential A sub 0 theta, where the partial derivative of A sub 0 with respect to theta = 0. Maxwell's equations are solved for the distorted potential A theta in the form of a rapidly converging series A = ξ A sub n. The A sub n's are given in a form suitable for evaluation by a digital computer. The nonequivalence of the apparently analogous problem of a stationary slug in a time-varying field is noted and discussed. (Author)

AD-620 244 See Fld. 4/2

AD-620 251 See Fld. 9/5

AD-620 324 Div. 25/3
CFSTI Prices: HC $2.00 MF $0.50
JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF MECHANICS
THE HALL EFFECT IN THE TWO-DIMENSIONAL FLOW ALONG AN INSULATING PLANE,
by H. Hasimoto, and G. S. Janowitz. 0 Jun 65, 33p. Contract AF49 638 496
AFOSR , 65-1201

Unclassified report

Descriptors: (*Magnetohydrodynamics, Hall effect), (*Hall effect, Magnetohydrodynamics), Two-dimensional flow, Solenoids, Drag, Mathematical analysis, Boundary layer

Two-dimensional flow of a conducting gas interacting weakly with an external inhomogeneous magnetic field is considered. It is proved that for flow over an insulating wall, the total drag force is reduced by the Hall effect, and the total transverse force is zero. General expressions for the Hall current and the induced transversal flow are obtained for the case of flow with small Hall parameter over an infinite insulating plane. Examples are given for the dipole magnetic field. An inversion of the transversal flow, varying with the dipole orientation, is found. This situation also suggests a transversal deflection of the flow behind a magnetized body in the flow of a plasma. (Author)

AD-620 364 Div. 25/3 ,25/5
LYMAN LAB OF PHYSICS HARVARD UNIV CAMBRIDGE MASS
SPIN DIFFUSION IN THE HEISENBERG PARAMAGNET,
by Herbert S. Bennett, and Paul C. Martin. 13 Nov 64, 12p. Contract AF49 638 589 Proj. 9751 Task 975101
AFOSR , 65-1346

Unclassified report

Pub. in Physical Review v138 n2A pA608-17 Apr 19 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Paramagnetic materials, Diffusion), (*Magnetic properties, Paramagnetic materials), (*Spin, Diffusion), Paramagnetic resonance, Integral equations, Correlation techniques, Hamiltonian, Green's function, Quantum mechanics

Two methods are presented for calculating the spin diffusion coefficient, the long-wavelength low-frequency limit of the spin pair correlation function. These methods are used to evaluate this coefficient in the isotropic Heisenberg paramagnet. In the first method, successively higher correlations are neglected, and eventually an approximate nonlinear integral equation is obtained. In the second, a dispersion relation and sum-rule moment relations are utilized. Expressions are obtained for the diffusion coefficient both at high temperatures and near the Curie temperature. The two evaluations of the diffusion constant at high temperatures agree with each other extremely well, and are in qualitative agreement with two previous determinations. (Author)

AD-620 436 See Fld. 20/6

AD-620 474 Div. 25/3
ROCHESTER UNIV N Y DEPT OF PHYSICS AND ASTRONOMY
STATIONARITY AND THE RANDOM PHASE CONDITION IN THE STATISTICAL THEORY OF THE ELECTROMAGNETIC FIELD,
by Y. Kano. 20 Mar 64, 14p. Contract AF AFOSR237 63 Proj. 9767 Task 976702
AFOSR , 65-1113

Unclassified report

Pub. in Annals of Physics, v30 n1 p127-37 Oct 1964. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Electromagnetism, Field theory), (*Field theory, Electromagnetism), Quantum mechanics, Statistical functions, Stochastic processes, Hamiltonian

The quantum mechanical analogue of the classical definition of stationarity of an electromagnetic radiation field is discussed. It is shown to imply that for an ensemble radiation field corresponding to a single momentum-spin state the phase space distribution function of the complex eigenvalues of the photon annihilation operators does not depend on the phases of the eigenvalues, i.e., the stationarity condition implies a uniform distribution of the phase angle of the eigenvalues. However, for a radiation field with a finite or countable infinite number of states, the stationarity condition is not a sufficient condition for the phase independence of the distribution function; it is shown that, in addition, the commutability of the density matrix and the number operator for each mode is required. The physical meaning of this commutability is investigated and it is shown to imply homogeneity of the radiation field. (Author)

AD-620 485 Div. 25/3
CALIFORNIA UNIV LOS ANGELES DEPT OF PHYSICS
RADIO-FREQUENCY BREAKDOWN IN A DC PARABOLIC POTENTIAL FIELD.
Revised ed.,
by Thomas W. Karras, and Erick Lindman,Jr.. 24 Jul 64, 7p. Contract AF AFOSR 567 64 ,NsG273 Proj. 9767 Task 976703
AFOSR , 65-1121

Unclassified report

Pub. in Journal of Applied Physics v36 n1 p18-22 Jan 1964 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 11 Feb 64.

Descriptors: (*Electric discharges, Radiofrequency), Voltage, Electrostatic fields, Radio fields, Magnetic resonance, Energy

Electrons that are confined in a Penning discharge geometry by electric and magnetic fields are observed to gain energy from a superimposed rf field. By shaping the electrodes in the form of hyperboloids of revolution the prebreakdown motion can be accurately described by the Mathieu equation. Resonances are predicted when the frequency of the electron in the electrostatic well is a multiple of half the rf frequency. In the pressure range investigated (air at 0.01 to 0.00001 Torr), values as low as 40-V dc and 3-V rf were observed at the first resonance under conditions where the Penning mechanism alone required over 400-V dc. Between resonances the Mathieu equation predicts runaway energy gain at considerably higher values of the rf voltage, but breakdown is observed at values much lower than the prediction. The explanation is found in energy gain through collisions with gas atoms. The collision resets the phase of the motion and allows the electron to continually gain energy from the rf field. Breakdown curves are calculated for the regions between resonances and are found to agree with experiment. (Author)

AD-620 537 Div. 25/3
ROYAL MILITARY COLL OF CANADA KINGSTON (ONTARIO) DEPT OF PHYSICS
CHARGE DECAY OF CARNAUBA WAX ELECTRETS.
Revised ed.,
by Martin M. Perlman, and Jean-Louis Meunier. 16 Sep 64, 8p. Contract DRB5501 08

Unclassified report

Pub. in Journal of Applied Physics, v36 n2 p420-7 Feb 1965. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Electrets, Waxes), (*Static electricity, Electrets), Dielectric properties, Polarization, Electric fields

The phenomenological theory of Wiseman and Feaster, based on the two-charge theory of Gross, expresses the polarization response of an absorptive dielectric as the superposition of responses to changes in the internal field, using a time-dependent specific polarization function. This theory is extended to explain quantitatively the charge decay of unshielded dielectrics of finite resistivity. From measurements of the net surface charge on unshielded Carnauba wax electrets at 40C and 0.00001 Torr, it is concluded on the basis of this theory: (i) that the internal field is the main decay agent, governing both polarization growth and real surface decay, which together account for the decay of the net surface charge; (ii) that there is no net local charge within the volume of the dielectric; (iii) that the volume resistivity is 9.0=0.5X10 to the 17th power omega-cm, and the dielectric constant at a frequency of the order of 1 cps is 3.08= 0.12. (Author)

AD-620 545 Div. 25/3 ,9/1
CFSTI Prices: HC $3.00 MF $0.75
MIAMI UNIV CORAL GABLES FLA DEPT OF PHYSICS
INJECTION AND TRAPPING OF PLASMA VORTEX STRUCTURES.
Plasma physics bull. v. 5 no. 1,
by Daniel R. Wells. 0 Jun 65, 64p. Contract AT40 1 3293 Grant ,AF AFOSR844 65

Unclassified report

Descriptors: (*Plasma medium, Vortices), (*Vortices, Magnetohydrodynamics), Magnetic fields, Magnetic pinch, Plasma oscillations, Charged particles, Injection, Vector analysis

Injection of a high density plasma into a magnetic mirror was accomplished by generating plasma vortex rings under both mirror coils. Observations indicated that the rings move toward the center of the mirror and collide. Trapped magnetic fields in the rings produced a field reversal at the center of the mirror. The collision was followed by an oscillating motion of the ring currents flowing in the highly ionized plasma. Plasma was trapped inside the mirror for times of the order of milli-seconds. There was no recycling of the gas in the mirror system. The plasma thermalized and then left through the escape cones and by diffusion to the walls. The ion temperature was of the order of 200 eV. Plasma volume was approximately 1000cc. Confining field was 10kG. (Author)

AD-620 664 Div. 25/3
CFSTI Prices: HC $2.00 MF $0.50
ILLINOIS UNIV URBANA GASEOUS ELECTRONICS LAB
COLLISION FREQUENCY MEASUREMENTS IN OXYGEN AND HELIUM MAGNETOPLASMA AFTERGLOWS.
Scientific rept.,
by G. E. Veatch, J. T. Verdeyen, and J. H. Cahn. 0 Jul 65, 44p. Rept. no. SR-2
Contract AF 19 628 2391 Proj. 8605, DASA5710 Task 860502, DASA7010
AFCRL(65-453

Unclassified report

Descriptors: (*Electric discharges, Plasma physics), (*Plasma medium, Transport properties), (*Kinetic theory, Electrons), Cyclotron resonance phenomena, Helium, Oxygen, Probability

Collision frequency measurements were carried out in helium and oxygen at thermal energies. The

helium measurements yield a collision probability of 18.7 at 300K and 1 torr pressure. This corresponds to a cross section for momentum transfer of 5.29 x 10 to the -16th power sq-cm. at 300K. The helium collision frequency f is directly proportional to approximately the first power of the velocity at 300K. The oxygen measurements yield a value of f = 4.6 x 10 to the -8th power N (O2)u where u is the electron energy in electron volts and N (O2) is the number density of oxygen molecules. The measurements were carried out by two independent methods. (Author)

AD-620 796 Div. 25/3 ,25/6
AEROSPACE RESEARCH LABS OFFICE OF AEROSPACE RESEARCH WRIGHT-PATTERSON AFB OHIO
HIGH-TEMPERATURE TRANSFERENCE NUMBER DETERMINATIONS BY POLARIZATION MEASUREMENTS,
by R. W. Vest, and N. M. Tallan. 24 Aug 64, 7p.
Rept. no. ARL-65-133
Unclassified report

Pub. in Journal of Applied Physics v36 n2 p543-7 Feb 1965 (Copies not available to DDC or Clearinghouse customers). Prepared in cooperation with Systems Research labs., Inc., Dayton, Ohio.

Descriptors: (*Oxides, Transport properties), (*Solid solutions, Transport properties), (*Zirconium alloys, Transport properties), (*Calcium alloys, Transport properties), Electrical conductance, Ionic current, Polarization, Measurement, Oxygen, Vapor pressure, High-temperature research

A polarization technique for the measurement of electronic and ionic transference numbers in mixed conductors is described; also a discussion of the conditions governing its applicability. The application of this technique is demonstrated by measurements on the solid solution Zr0.85 Ca0.15 O1.85, which is shown to be intrinsically a pure oxygen ion conductor even at room temperature at an oxygen partial pressure 10 to the -9th power atm. The electronic conductivity in this material can be increased significantly at low oxygen partial pressures by the addition of transition metal impurities. (Author)

AD-620 804 Div. 25/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
LONGITUDINAL STABILITY OF ONE-DIMENSIONAL FLOW OF A CONDUCTING GAS,
by E. V. Artyushkov, and A. I. Morozov. 9 Aug 65, 22p. Rept. no. FTD-TT-65-953
TT , 65-63847
Unclassified report

Unedited rough draft trans. of Teplofizika Vysokikh Temperatur (USSR) v2 n4 p525-34 1964. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Magnetohydrodynamics, Stability), Thermal conductivity, Electrical conductance, Onedimensional flow, Gas flow, Magnetic fields, Oscillation, Partial differential equations, Gas ionization, USSR

The stability of short-wave longitudinal oscillations in one-dimensional flow of a gas with finite conductivity in a magnetic field is investigated. Defrosted oscillations are considered taking into account large and small thermal conductivity. Expressions are obtained which determine the variation in wave amplitude along the flow. (Author)

20/4. FLUID MECHANICS

AD-620 105 Div. 9/6 ,15/1
CFSTI Prices: HC $2.00 MF $0.50
MATHEMATICS RESEARCH CENTER UNIV OF WISCONSIN MADISON
AN APPLICATION OF THE 'PLK-METHOD' TO CONFORMAL MAPPING AND THIN AIRFOIL THEORY.
Technical summary rept.,
by J. Weissinger. 0 May 65, 27p. Rept. no. MRC-TSR-568
Contract DA11 022ORD2059
Unclassified report

Descriptors: (*Airfoils, Theory), (*Conformal mapping, Airfoils), Partial differential equations, Aerodynamic configurations, Thin wings, Boundary value problems, Angle of attack

It is a widespread opinion that the 'PLK-Method' ('for rendering approximate solutions to physical problems uniformly valid') cannot be applied to problems of elliptic partial differential equations, especially not to thin airfoil theory. It is shown that this is not true-at least for symmetrical airfoils - if right use is made of the flexibility of the technique. An example shows that the technique can be used very successfully for numerical computations. (Author)

AD-620 108 Div. 9/1 ,15/1
CFSTI Prices: HC $2.00 MF $0.50
MATHEMATICS RESEARCH CENTER UNIV OF WISCONSIN MADISON
NUMERICAL SOLUTIONS OF THE NAVIER-STOKES EQUATIONS FOR THE FLOW IN A CHANNEL WITH A STEP.
Technical summary rept.,
by Mitutosi Kawaguti. 0 May 65, 35p. Rept. no. MRC-TSR-574
Contract DA11 022ORD2059
Unclassified report

Descriptors: (*Fluid flow, Partial differential equations), Viscosity, Strain (Mechanics), Reynolds number, Numerical analysis

The steady flow of a viscous fluid in a channel with a forward facing or a backward facing step is studied numerically. It is assumed that the channel is bounded by rigid walls, and the flow in the channel far from the step is the Poiseuille flow. It is shown that the length of a standing vortex behind a backward facing step increases roughly proportionally to the Reynolds number (R< or= 64). The pressure loss due to a forward facing step increases with the Reynolds number, on the other hand, due to a backward facing step, it decreases with the Reynolds number. (Author)

AD-620 120 Div. 9/6
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
STATIONARY WORKING CONDITIONS OF A SUPERSONIC GAS EJECTOR,
by I. G. Portnov. 3 Jun 65, 11p. Rept. no. FTD-TT-65-153
TT , 65-63338
Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR. Otdelenie Tekhnicheskikh Nauk. Izvestiya, n4 p106-9 1957.

Descriptors: (*Supersonic flow, Ejection), (*Supersonic diffusers, Ejection), USSR, Pressure, Mathematical analysis

AD-620 143 Div. 9/1
CFSTI Prices: HC $1.00 MF $0.50
PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF AERONAUTICAL ENGINEERING
A MOLECULAR VISCOELASTICITY INTERPRETATION OF THE WALL SHEAR STRESS THRESHOLD IN THE TOMS EFFECT,
by A. G. Fabula, J. L. Lumley, and W. D. Taylor. 01965, 20p. Contract Nonr65633
Unclassified report

Also supported by U. S. Bureau of Naval Weapons. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Turbulence, Theory), (*Viscoelasticity, Molecules), (*Shear stresses, Turbulence), Friction, Reynolds number, Polymers, Fluid flow

The turbulent-flow friction reduction produced by very low concentrations of linear macromolecules in good solvents was shown by Virk and by Elata and Tirosh to occur only when the pipe wall shear stress exceeds a particular threshold value for each polymer. A viscoelastic hypothesis is suggested in which the threshold corresponds to a viscoelastic dispersion like that which is theoretically and experimentally found for dilute solutions subjected to oscillatory shear about zero mean shear rate. A preliminary comparison with experiment for unfractionated polyethylene oxide show that the order of magnitude of the shear stress threshold value is predicted correctly.

AD-620 159 Div. 9/7
CFSTI Prices: HC $2.00 MF $0.50
TECHNION - ISRAEL INST OF TECH HAIFA DEPT OF AERONAUTICAL ENGINEERING
SUPERSONIC FLOW OVER TWO-DIMENSIONAL AND AXIALLY SYMMETRIC BACKWARD FACING STEPS.
Annual summary rept. no. 2,
by Josef Rom. 0 Mar 64, 33p. Rept. no. TAE-33
Contract AF61 052 576
Unclassified report

See also AD-425 677.

Descriptors: (*Supersonic flow, Separation), (*Airfoils, Supersonic flow), Two-dimensional flow, Turbulence, Axially symmetric flow, Laminar flow, Shock waves, Mathematical analysis, Israel

AD-620 193 Div. 9/1 ,15/1
CFSTI Prices: HC $1.00 MF $0.50
GENERAL ATOMIC DIV GENERAL DYNAMICS CORP SAN DIEGO CALIF
REMARKS ON SIMILARITY SOLUTIONS FOR HYPERVELOCITY IMPACT,
by T. Teichmann. 26 Jul 65, 13p. Rept. no. GAMD-6501
Contract DA04 495AMC116X Proj. 341, ARPA Order71-62
Unclassified report

Descriptors: (*Hydrodynamics, Impact shock), (*Partial differential equations, Hydrodynamics), Perturbation theory, Conformal mapping, Boundary layer, Gas flow, Matrix algebra

The use of similarity flows is discussed in certain hydrodynamic impact problems, as a basis for approximate analytical solutions. After a qualitative discussion of various ways in which such solutions may be obtained, a single derivation is obtained of a class of oneparameter similarity flows for problems in 1, 2 and 3 dimensions, which includes substantially all those used previously, and allows the superposition of constant uniform motions. The perturbation equations which relate the asymptotic form of the actual solution to such similarity flows (under some conditions) are explicitly formulated and the equations of the characteristic surfaces which determine their behavior are derived. (Author)

AD-620 196 Div. 9/5 ,25/8
CFSTI Prices: HC $3.00 MF $0.75
GENERAL DYNAMICS/POMONA CALIF
AREOTHERMAL EFFECTS ON STRUCTURES.
Rept. for Apr-Dec 64,
by R. G. Shook, and H. Dershin. 0 Mar 65, 72p.
Contract AF33 615 1520 Proj. 1467 Task 146702
FDL , TR-65-82
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Aerothermoelasticity. Mathematical analysis). (*Thermal stresses. Aerospace craft). Aerodynamic heating. Three-dimensional flow. Aerodynamic configurations. Data processing systems. Computers. Thermodynamics. Irreversible processes

The methods of thermal stress analysis due to M. A. Biot are applied to the solution of one. two. and three dimensional thermal stress problems. Both transient and steady-state cases are considered. Specific examples are used to demonstrate. step by step. the application of the basic theory. Detailed results are given. Emphasis is placed on examples which permit comparison of results with classical solutions. Also developed. in general form. is a computer oriented method which can be applied to structures of arbitrary shapes subjected to arbitrary heating conditions. Furthermore. pertinent portions of Biot's theory are included when required as background for the specific approaches developed. (Author)

AD-620 215 Div. 9/1
CFSTI Prices: HC $4.00 MF $1.00
LOCKHEED MISSILES AND SPACE CO SUNNYVALE CALIF
THE DEFORMATION OF ORTHOTROPIC SHELLS OF REVOLUTION UNDER NONSYMMETRIC EDGE LOADS.
Doctoral thesis.
by W. Flugge. and R. F. Hartung. 0 Apr 65. 141p. Rept. no. LMSC-TR-6-75-65-13
Unclassified report

Prepared in cooperation with Stanford Univ., Calif.

Descriptors: (*Bodies of revolution. Deformation). (*Aerodynamic loading. Deformation). (*Structural shells. Deformation). Differential equations. Stresses. Mathematical analysis. Harmonic analysis

The deformations which occur in a thin shell of revolution subjected to slowly varying. nonsymmetric edge loads are determined. The shell is assumed to be orthotropic with the axes of elastic symmetry coinciding with the lines of principal curvature of the shell middle surface. Furthermore. the meridian curves are considered to be smooth and parabolic of degree n at the apex. but otherwise arbitrary. The problem is reduced to the study of an eighth-order system of three simultaneous. ordinary differential equations with the meridional. circumferential. and normal displacements as dependent variables. For a shell which is non-shallow. the equations are satisfied approximately by four exponentially behaving edge-effect solutions and four slowly varying algebraically behaving membrane and inextensional bending solutions. For a shallow shell however. the assumptions upon which the membrane theory is based are violated and eight rapidly varying power series solutions are obtained. Finally. by suitable transformations. uniformly valid solutions are obtained which reduce to both the previously determined shallow and non-shallow results in the appropriate region of the shell. Expressions for the stress resultants and stress couples are then given. (Author)

AD-620 217 Div. 9/6
CFSTI Prices: HC $3.00 MF $0.75
LOCKHEED MISSILES AND SPACE CO SUNNYVALE CALIF
ENGINEERING ANALYSIS OF BOUNDARY LAYERS AND SKIN FRICTION ON BODIES OF REVOLUTION AT ZERO ANGLE OF ATTACK.
by D. J. Eckstrom. 0 May 65. 57p. Rept. no. TM-55-21-21 .LMSC/805162
Unclassified report

Descriptors: (*Bodies of revolution. Supersonic flow). (*Supersonic characteristics. Bodies of revolution). Cylindrical bodies. Friction. Conical bodies. Mathematical analysis. Heat transfer. Aerodynamic heating. Compressible flow. Boundary layer. Thickness. Momentum. Angle of attack. Flat plate models. Turbulence

The reference temperature method of predicting skin friction coefficients for supersonic flow with heat transfer is described in detail. Techniques which are simple enough for practical engineering application are presented for applying the methods to bodies of revolution consisting of a cone. cylinders. and conical frusta. A sample calculation is carried out. and a significant improvement over the traditional insulated flat plate method is found. The influences of compressibility and heat transfer on the growth of boundary-layer thickness. momentum thickness. and displacement thickness on a flat plate with zero pressure gradient are presented. The literature concerning boundary-layer transition is reviewed. and the influence of several of the more important parameters evaluated. Only the zero angle of attack case is considered. (Author)

AD-620 246 Div. 9/6 ,9/7
CFSTI Prices: HC $2.00 MF $0.50
MISSISSIPPI STATE UNIV STATE COLLEGE DEPT OF AEROPHYSICS
A COMPARISON OF THE THEORETICAL DETERMINATION OF THE DEVELOPMENT OF THE BOUNDARY LAYER MOMENTUM THICKNESS IN AN ARBITRARY PRESSURE GRADIENT WITH FULL-SCALE FLIGHT EXPERIMENTS ON A POROUS AIRFOIL SECTION WITH TRANSPIRATION.
Research rept..
by Hideki Yamaoka. and J. J. Cornish.III.. 0 Jul 65. 37p. Rept. no. RR-59
Contract DA44 177AMC892T Task 1P121401A14203
USAAVLABS . TR-65-41
Unclassified report

Descriptors: (*Wings. Aerodynamic characteristics). (*Turbulent boundary layer. Momentum). Thickness. Numerical analysis. Gliders. Flight testing. Twodimensional flow. Axially symmetric flow. Graphics. Porous materials. Pressure

Calculation of the turbulent boundary layer momentum thickness around a NACA 4416 airfoil section was made by a successive approximation method developed for twodimensional and axisymmetric flows. These results are compared with experimental results obtained from flight tests with a sailplane--Schweizer TG-3--with reasonable results. (Author)

AD-620 323 Div. 9/4
CFSTI Prices: HC $4.00 MF $1.00
JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF MECHANICS
SELF-SIMILAR HYDRODYNAMICS WITH VORTEX SHEETS.
by Richard Coval Alexander. 0 Jun 65. 127p.
Contract AF49 638 496
AFOSR . 65-0642
Unclassified report

Descriptors: (*Hydrodynamics. Vortices). (*Vortices. Hydrodynamics). Jets. Turbulence. Mathematical analysis. Iterative methods. Stability. Two-dimensional flow

The problem of vortex sheets caused by the motion of sharp obstacles with respect to fluid may be treated with the aid of a similarity law. The subject is given further breadth by including the Helmholtz instability phenomenon. This is accomplished by posing a problem in which the plane interface of a two-dimensional jet is subjected to a self-similar disturbance. Unity of the analysis is achieved by a semi-inverse approach which treats all problems asymptotically in the neighborhood of rolled-up vortex sheets. or as time t tends to infinity. A suggested iterative technique for finding total solutions is given. (Author)

AD-620 332 Div. 9/1 ,9/6
CFSTI Prices: HC $2.00 MF $0.50
LOCKHEED MISSILES AND SPACE CO SUNNYVALE CALIF
A STUDY OF THE DEVELOPMENT OF STEADY SEPARATED FLOWS. PART I. LINEARIZED ANALYSIS OF CIRCULAR EDDIES.
Technical rept. on Aerophysics.
by Odus Burggraf. 26 Jun 64. 34p. Rept. no. 6-74-64-34
Unclassified report

Descriptors: (*Turbulence. Mathematical analysis). Reynolds number. Wake. Spheres. Boundary layer. Separation. Vortices

The viscous structure of a separated eddy is investigated for the case of a simplified geometry. An analytical solution is obtained for an eddy bounded by a circular streamline. based on a linearized model. This solution shows in a simple manner the development from a completely viscous eddy at low Reynolds number to an inviscid rotational core at high Reynolds number. Quantitatively. the solution shows that a significant inviscid core exists for Reynolds number greater than 100. At low Reynolds number the vortex center shifts in the direction of the boundary velocity until the inviscid core develops; at large Reynolds number. the inviscid vortex core is symmetric about the center of the circle. except for the effect of the boundarylayer displacement-thickness. Special results are obtained for velocity profiles. skin-friction distribution. and total power dissipation in the eddy. In addition. results of the method of inner and outer expansions are compared with the complete solution. indicating that expansions of this type give valid results for separated eddies at Reynolds numbers greater than about 25 to 50. The validity of the linear analysis as a description of separated eddies is confirmed to a surprising degree by numerical solutions of the full Navier-Stokes equations for an eddy in a square cavity. (Author)

AD-620 338 Div. 9/7 ,25/1
CFSTI Prices: HC $1.00 MF $0.50
TORONTO UNIV (ONTARIO) INST FOR AEROSPACE STUDIES
AERODYNAMICALLY GENERATED SOUND.
Final scientific rept..
by H. S. Ribner. 0 Dec 64. 23p. Contract AF AFOSR223 64 Proj. 9781 Task 978102
AFOSR . 65-1029
Unclassified report

Descriptors: (*Sound. Aerodynamic characteristics). (*Jets. Turbulence). Airplane noise. Vibration. Refraction. Canada

The research accomplishments of the project are summarized. A study of surface motion in turbulence-induced panel vibration demonstrated that panel motion consists of running waves forced by the convected pressure field superposed on a more irregular pattern. Turbulent structure in the transition region. (4.5 to 8 diams downstream of the nozzle) of a 4-in. low-speed jet was investigated with the aim of relating the turbulence to the noise generating features of such a jet. Progress has been made in improving the accuracy of the hot-wire and time-delay correlator instrumentation. and timing. gate. and relay circuits were developed to semi-automate data processing. Constanttemperature hot-wires were found to obey a sine law quite accurately over a wide range when inclined to the stream. An aerofoil probe for measuring the transverse component of turbulence was also developed. Lastly. an anomaly in the directivity pattern of jet noise was resolved. Measurements in an anechoic room with a harmonic point sound source placed in an air jet indicated that the sound appears to be refracted away from the jet axis. This gives a marked dimple in the sound directivity pattern very similar to the dimple found with random jet noise. (Author)

AD-620 352 Div. 9/1
CFSTI Prices: HC $3.00 MF $0.50
CINCINNATI UNIV OHIO DEPT OF AEROSPACE ENGINEERING
STUDIES ON DISSOCIATING GASDYNAMICS. PART I. ON THE LINEARIZED DISSOCIATING GASDYNAMICS.
Technical rept..

by Ting Y. Li. and Shu J. Hsia. 0 Jul 65. 54p.
Rept. no. TR-AE-6501
Contract AF AFOSR416 64A
AFOSR . 65-0849

Unclassified report

Descriptors: (*Dissociation, Gas flow), (*Gas flow, Turbulence), (*Diatomic molecules, Gas flow), Supersonic flow, Partial differential equations, Nonequilibrium flow, Green's function

After a brief review of some recent advances in the study of the inviscid nonequilibrium gasdynamics and of the linear nonequilibrium flow equations, a small disturbance solution is obtained for a dissociated diatomic gas flowing around a striaght two-dimensional corner. The analysis is based on a small disturbance technique in which small departure from free stream conditions are assumed. Under the small disturbance approximation, the gasdynamic equation and atom mass rate equation for a dissociated diatomic gas can both be linearized. A method of superposition to solve these linearized partial differential equations is then developed through the application of the well known Green's theorem. An 'oxygen-like' ideal dissociating gas is used as an example in calculating the flow around a straight corner in a supersonic stream. The variation of flow properties at wall condition in the relaxation zone are found and compared with Clark's solution. (Author)

AD-620 442 **See Fld. 1/3**

AD-620 449 **See Fld. 14/2**

AD-620 468 Div. 9/1 ,9/4
CFSTI Prices: HC $3.00 MF $0.75
NATIONAL MARINE CONSULTANTS DIV INTERSTATE ELECTRONICS CORP ANAHEIM CALIF
MONO LAKE WAVE EXPERIMENT: FEASIBILITY STUDY.
Final rept.
0 Jun 65. 79p. Rept. no. NMC-ONR-65
Contract Nonr448800

Unclassified report

Descriptors: (*Water waves, Explosion effects), (*Hydrodynamics, Test facilities), Explosions, Nuclear explosions, Simulation, Lake waves, Beaches, Damage Ranges (Establishments), Site selection, Instrumentation, Costs, Feasibility studies

The feasibility of conducting experiments during which bomb-wave runup mechanics could be observed and measured has been considered. Investigations indicate that the program, as envisioned, is feasible at Mono Lake. The following report presents the results of the study regarding: Site Selection and Investigation, range instrumentation and operation, and cost-estimate for the program. (Author)

AD-620 472 Div. 9/1 ,9/2
POLYTECHNIC INST OF BROOKLYN N Y
FURTHER SIMILARITY SOLUTIONS OF AXISYMMETRIC WAKES AND JETS.
by Martin H. Steiger, and Martin H. Bloom. 18 Sep 64. 5p. Contract AF AFOSR1 63 Proj. 9781 Task 978101
AFOSR . 65-1152

Unclassified report

Pub. in AIAA Journal v3 n3 p548-50 Mar 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Wake, Axially symmetric flow), (*Jets, Axially symmetric flow), Compressible flow, Boundary value problems

Further solutions are presented to the similarity equation $(n(F'/n)')' + F(F'/n)' + Bn(1-(F'/n)2) = 0$ subject to boundary conditions $F = (F'/n)' = 0$ at $n = 0$ and $F'/n = 1.0$ as n goes to infinity. An extension to compressible flow is described which applies rigorously if the density ratio can be a function of the similarity variable n only. Exact and integral method solutions of the similarity equation are presented in the ranges $-1.0 < B < -0.5$ and $0.5 < B < 4.0$. (Author)

AD-620 479 **See Fld. 20/1**

AD-620 488 **See Fld. 8/10**

AD-620 524 Div. 9/4 ,30/2
CFSTI Prices: HC $3.00 MF $0.50
CORNELL AERONAUTICAL LAB INC BUFFALO N Y
FORCES AND MOMENTS ON AN OSCILLATING HYDROFOIL WITH AN OSCILLATING FLAP; ADDENDUM.
Final technical rept., Add., for Feb 63-Feb 65,
by John M. Grace, and Irving C. Statler. 0 Aug 65. 53p. Rept. no. CAL-BB-1798-S-2
Contract NObs88342 Proj. SS600 000 Task 1719

Unclassified report

See also AD-611 067.

Descriptors: (*Hydrofoils, Oscillation), (*Programming (Computers), Hydrofoils), Moments, Force (Mechanics), Pitch (Motion), Tables, Digital computers

The purpose of the addendum is to provide a detailed description of the digital computer program used in the study of forces and moments on an oscillating hydrofoil with an oscillating flap, and also provides an extensive tabulation of all the numerical results which were generated.

AD-620 532 **See Fld. 20/1**

AD-620 535 Div. 9/5 ,12/1
CASE INST OF TECH CLEVELAND OHIO
MELTING DECELERATING BODIES.
by Simon Ostrach. 01962. 28p. Contract AF AFOSR194 63
AFOSR . 65-1156

Unclassified report

Pub. in Nonlinear Problems of Engineering, p137-62 1964. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Ablation, Deceleration), (*Atmosphere entry, Ablation), (*Melting, Ablation), Bodies of revolution, Heat-resistant glass, Fluid flow, Heat transfer, Perturbation theory, Differential equations

An analysis is presented of the flow and heat transfer of a glassy viscous film of ablating material on the exterior surface of a body of revolution or a symmetric 2-dimensional body which enters the atmosphere at high speed and which experiences large deceleration and surface heating. The nonlinear problem associated with this type of ablation is considered. Results indicate that the ablation process can be theoretically described at the extremes in time, but more work is needed for intermediate times. An example is presented in which the ablative material is Pyrex. (Author)

AD-620 545 **See Fld. 20/3**

AD-620 549 Div. 9/7 ,30/6 ,16/1
CFSTI Prices: HC $3.00 MF $0.50
MINNESOTA UNIV MINNEAPOLIS INST OF TECH
RESEARCH ACTIVITIES.
Quarterly rept. for 1 Jul-30 Sep 50.
30 Sep 50. 58p. Rept. no. RR-71

Unclassified report

Descriptors: (*Aerodynamic characteristics, Scientific research), Subsonic flow, Lift, Wind tunnels, Exhaust gases, Cooling, Ultrasonic radiation, Physiology, Specific heat, Relaxation time, Shear stresses, Bodies of revolution

Contents: Wind tunnel tests to determine the development of unsteady lift at high subsonic velocities; Experimental investigation of certain parameters of exhaust gas cooling systems; The physiological effects of ultrasound; Study of the ratio of specific heats and relaxation time effects in air and other gases; An attempt to reduce the starting power requirements of supersonic wind tunnels; Measurement of shearing stress on a body of revolution.

AD-620 671 **See Fld. 14/2**

AD-620 699 Div. 9/7 ,12/1
CFSTI Prices: HC $6.00 MF $1.75
SPACE AND INFORMATION SYSTEMS DIV NORTH AMERICAN AVIATION INC DOWNEY CALIF
DYNAMICS OF SHELL-LIKE LIFTING BODIES. PART II. THE EXPERIMENTAL INVESTIGATION.
Final rept. for 1 May 63-1 Dec 64,
by A. C. Park, F. C. Hung, C. Chan, L. V. Andrew, and L. L. T. Au. 0 Jun 65. 205p. Rept. no. SID-64-2074-2
Contract AF33 657 11115 Proj. 1370 Task 137003
FDL . TR-65-17, P2

Unclassified report

Descriptors: (*Structural shells, Dynamics), (*Reentry vehicles, Configuration), Aerothermoelasticity, Model tests, Aerodynamic characteristics, Taper, Reinforcing materials, Aerodynamic loading, Transducers, Tables, Lift

The vibration characteristics of nine typical shell configurations were experimentally determined. The models were of similar size and construction and consisted of three unstiffened models and six models stiffened with both longitudinal stringers and transverse flexible frames. Models were mounted with free-fixed boundary conditions. At least the twelve lowest natural frequencies and their corresponding mode shapes were determined and recorded for each model. A cursory investigation of panel response was performed upon selected configurations. A static investigation was conducted upon one configuration to obtain structural flexibility influence coefficients. The information obtained was examined briefly and some conclusions were drawn regarding the effects of several parameters including model crosssection (circular or elliptic), degree of longitudinal taper, skin panel thickness, number and spacing of axial and transverse stiffeners and number, orientation, and location of the exciting electromagnetic shakers. (Author)

AD-620 712 **See Fld. 8/10**

AD-620 763 **See Fld. 19/4**

AD-620 770 Div. 9/6
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
ORIGINATION OF CONDENSATIONS IN SUPERSONIC FLOWS OF RAREFIED GASES,
by A. A. Pomerantsev. 12 Aug 65. 11p. Rept. no. FTD-TT-65-621
TT . 65-63827

Unclassified report

Unedited rough draft trans. of Inzhenerno-Fizicheskii Zhurnal (USSR) v7 n8 p59-63 1964.

Descriptors: (*Condensation, Supersonic flow), (*Superaerodynamics, Supersonic flow), (*Supersonic flow, Condensation), Shock waves, Supersonic flight, Airfoils, Perturbation theory, Mathematical analysis, Molecules, USSR

An explanation is given of the disappearance of molecular condensations in a sharply rarefied gas, which allows one to calculate the heights of appearance of condensations in front of bodies entering a rarefied layer, in which freemolecular flows cease. (Author)

AD-620 793 Div. 9/6
AEROSPACE RESEARCH LABS OFFICE OF AEROSPACE RESEARCH WRIGHT-PATTERSON AFB OHIO
RELATIONSHIPS BETWEEN DRAG AND PERIODIC VORTEX SHEDDING,
by Brian P. Quinn. 11 Sep 64, 4p. Rept. no. ARL-65-145
Unclassified report

Pub. in AIAA Journal v3 n3 p542-3 Mar 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Drag, Vortices), (*Vortices, Drag), Boundary layer, Sound signals

AD-620 795 Div. 9/6
AEROSPACE RESEARCH LABS OFFICE OF AEROSPACE RESEARCH WRIGHT-PATTERSON AFB OHIO
HYPERSONIC STABILITY DERIVATIVES OF BLUNTED SLENDER CONES,
by Otto Walchner, and James T. Clay. 21 Oct 64, 5p. Rept. no. ARL-65-150
Unclassified report

Pub. in AIAA Journal v3 n4 p752-4 Apr 1965. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Conical bodies, Hypersonic characteristics), (*Slender bodies, Hypersonic characteristics), (*Blunt bodies, Hypersonic characteristics), Stability, Correlation techniques, Angle of attack, Reynolds number, Mathematical analysis

A semiempirical theory is presented based on Cheng's analysis of slender blunted cones at zero angle of attack, while the tangent cone approximation is used to account for angle-of-attack effects. Quasi steady-state conditions are assumed to be valid.

AD-620 805 Div. 9/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
EXPERIMENTAL INVESTIGATION OF DISPERSION CHARACTERISTICS OF CENTRIFUGAL INJECTOR NOZZLES OF GREATER PRODUCTIVITY,
by R. B. Akhmedov, L. M. Tsirulnikov, A. D. Gorbanenko, and B. L. Zharkov. 18 Aug 65, 14p. Rept. no. FTD-TT-65-1113
TT, 65-63848
Unclassified report

Unedited rough draft trans. of Akademiya Nauk Uzbekskoi SSR. Tashkent. Izvestiya. Seriya Tekhnicheskikh Nauk v6 n- p66-73 1964.

Descriptors: (*Fuel nozzles, Fluid dynamic properties), (*Fuel injectors, Fuel nozzles), Atomization, Centrifugal fields, Liquids, Fuels, Drops, USSR, Fuel sprays

An increase in diameter of output opening on injector nozzle changes the effect of liquid pressure and structural parameters of the nozzle on the fineness of fuel dispersion. The existing semi-empitical criterial ratios, obtained during the study of low yield nozzles, cannot be used to determine the characteristic dimensions of liquid droplets, dispersed by nozzles of greater yield. Injector nozzles of greater yield of A type possess better dispersion qualities than B type nozzles. (Author)

AD-620 807 **See Fld. 21/7**

20/6. OPTICS

AD-620 096 Div. 25/4 ,20/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
EFFECT OF GAMMA-RADIATION ON CERTAIN OPTICAL PROPERTIES OF SYNTHETIC RUBY,
by S. V. Starodubtsev, and M. S. Yunusov. 25 Jun 65, 6p. Rept. no. FTD-TT-65-20
TT, 65-63332
Unclassified report

Unedited rough draft trans. of Akademiya Nauk Uzbekskoi SSR. Tashkent. Izvestiya. Seriya Fiziko-Matematicheskikh Nauk, v8 n1 p92-4 1964. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Lasers, Optical properties), (*Radiation damage, Lasers), Ruby, Synthetic stones, Gamma rays, USSR

Crystals of bright pink ruby were examined (content Cr2O3 0.2%) to investigate the appearance of color centers, their dependence upon dosage of radiation, stability of these centers, as well as the process of their decolorization. We bombarded with gamma rays Co60 with a dosage capacity of 350 r/sec at a temperature in the source of 34C.

AD-620 100 Div. 25/4 ,8/6
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
ACCELERATING SYSTEM WITH DRIFT TUBES AT SUPERSONIC FREQUENCIES,
by V. B. Krasovitskii, and V. I. Kurilko. 24 Jun 65, 9p. Rept. no. FTD-TT-65-652
TT, 65-63336
Unclassified report

Unedited rough draft trans. of Ukrayins'kyi Fizychnyi Zhurnal (USSR) v9 n10 p1134-6 1964.

Descriptors: (*Diffraction gratings, Optics), (*Optics, Diffraction gratings), Light transmission, Waveguides, Dielectric properties, Attenuation, Acceleration, Electromagnetic waves, Propagation, USSR

In this report is discussed a problem of exciting a wave with phase velocity in a cylindrical diffraction grid (diffraction grating) formed by infinitely thin rings of radius a and width 1/2 (1 - period of grating). It is shown that such a wave can be excited whereby the filling of the system with a dielectric with epsilon equivalent 1 assures the possibility of focusing the field close to the axis of the system. It is also shown, that in such a system is possible propagation of waves, attenuation of which, due to irradiation through the slots of the grating, is small. (Author)

AD-620 129 **See Fld. 9/3**

AD-620 169 Div. 25/4 ,25/7
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP SANTA MONICA CALIF
RAYLEIGH AND RAMAN SCATTERING IN MOLECULAR NITROGEN,
by Horace A. Ory, and Harlod T. Yura. 0 Aug 65, 31p. Rept. no. RM-4664-ARPA
Contract SD79 Proj. arpa order 189-61
Unclassified report

Descriptors: (*Light transmission, Nitrogen), (*Lasers, Light), (*Molecular structure, Nitrogen), Scattering, Polarization, Perturbation theory

The static polarizability and the cross sections for Rayleigh and rotational Raman scattering in molecular nitrogen are calculated by a direct perturbation technique. This approach is based on an effective intermediate state energy that is approximated closely through knowledge of potential energy curves for the nitrogen electronic states. Results obtained for the static polarizability agree with experimental values within about 20 per cent and represent considerable improvement over earlier calculations. The cross section for Rayleigh scattering is given for various polarizations and scattering angles, and is found to agree with experiment within about 30 per cent. The rotational Raman forward scattering cross section is obtained as a function of rotational level, and Stokes scattering from the J = 6 level is shown to be most easily stimulated in Raman lasers at room temperature, for illumination by ruby laser light. (Author)

AD-620 182 **See Fld. 8/10**

AD-620 185 Div. 25/4
CFSTI Prices: HC $4.00 MF $1.00
INSTITUTE OF OPTICS UNIV OF ROCHESTER N Y
TIME RESOLVED SPECTROSCOPY AND INTERFEROMETRY ON LASER RODS, APPENDIX I. A STUDY OF THE EMISSION FROM A TRAVELING WAVE RUBY LASER, APPENDIX II.
Final scientific rept. for 1 Sep 62-30 Nov 64,
by Michael Hercher, and Claude Benzing Smoyer. 0 Jun 65, 126p. Contract AF19 628 2360 Proj. 4645 Task 464502
AFCRL, 65-467
Unclassified report

Descriptors: (*Lasers, Line spectrum), Ruby, Spectroscopy, Diffusion, Resolution, Emissivity, Interferometers, Pumping (Electronics), Excitation, Traveling-wave tubes, High-speed photography

Investigations carried out on solid state laser phenomena are described. High speed photography of near field phenomena in the radiation from several ruby lasers shows the very complex distribution of intensity both in space across the face of the ruby and in time ('spiking'). Time resolved interferometry was carried out on laser rods under pump conditions, but without lasing, to observe effects of heating by the pump radiation. Evidence of spectral narrowing in the output of a traveling wave ruby laser is presented. A comparison of equivalent traveling and standing wave cavities shows that for similar excitation, spectral narrowing of better than a factor of four can be achieved. However, multimoding in this experimental arrangement is still strongly evident. Results of preliminary experiments in 'Q' switching the traveling wave cavity are presented.

AD-620 206 Div. 25/4
OFFICE OF NAVAL RESEARCH WASHINGTON D C
QUANTUM ELECTRONICS III. VOLUME 1.
Proceedings of the International Conference on Quantum Electronics (3rd), Paris, 11-15 Feb 63, by Pierre Grivet, and Nicolaas Bloembergen. 01964, 939p.
Unclassified report

Also sponsored by the International Radio Union and Federation Nationale des Industries Electroniques. Available from Columbia University Press, New York, $35.00/2 volumes, vol. 1, and vol. 2 AD-620 207.

Descriptors: (*Masers, Symposia), (*Lasers, Symposia), Electronics, Quantum mechanics, Microwave spectroscopy, Magnetic resonance, Noise (Radio), Pumping (Electronics), Magnetometers, Molecular beams, Gases, Solid state physics, Semiconductor devices

Contents: Theory of coherence and noise: Optical pumping and magnetometers: Molecular beam masers: Gas lasers: Spectroscopy of solid state maser materials: Solid state masers.

AD-620 207 Div. 25/4 ,25/6
OFFICE OF NAVAL RESEARCH WASHINGTON D C
QUANTUM ELECTRONICS III. VOLUME 2.
Proceedings of the International Conference on Quantum Electronics (3rd), Paris, 11-15 Feb 63,

by Pierre Grivet, and Nicolaas Bloembergen. 01964, 912p.

Unclassified report

Also sponsored by the International Radio Union and Federation Nationale des Industries Electroniques. Available from Columbia University Press, New York, $35.00/2 volumes, vol. 1 AD-620 206, and vol. 2.

Descriptors: (*Masers, Symposia), (*Lasers, Symposia), Electronics, Quantum mechanics, Microwave spectroscopy, Magnetic resonance, Solid state physics, Semiconductor devices, Optics, Phonons

Contents: Solid state lasers; Lasers modes and special techniques; Non-linear optics; Semiconductor and phonon masers.

AD-620 249 Div. 25/4
CFSTI Prices: HC $3.00 MF $0.75
ILLINOIS UNIV URBANA COORDINATED SCIENCE 0AB
GROUND STATE OCCUPATION PROBABILITIES FOR OPTICALLY PUMPED ALKALI METAL ATOMS,
by Frank A. Franz. 0 Aug 65, 69p. Rept. no. R-265
Contract DA28 043AMC00073E Proj. 20014501B31F

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Alkali metals, Excitation), (*Atomic energy levels, Excitation), Optical phenomena, Relaxation time, Probability, Statistical distributions, Nuclear spins, Tables

The purpose of the report is to present calculations of the relative populations of the ground state Zeeman sublevels of an optically pumped alkali atom. Two modes of optical pumping--zero mixing and complete mixing in the excited state--and three modes of alkali relaxation--uniform, Zeeman, and electron randomization--are considered. Calculations of the sublevel relative populations for an alkali atom of nuclear spin 3/2 are then made in terms of experimentally measurable parameters for all six combinations of pumping and relaxation modes. The numerical results are summarized in tables as functions of pumping and relaxation rates. (Author)

AD-620 289 See Fld. 20/8

AD-620 318 Div. 25/4 ,8/2
CFSTI Prices: HC $1.00 MF $0.50
WESTINGHOUSE ELECTRIC CORP ELMIRA N Y ELECTRONIC TUBE DIV
APPLICATION OF LIGHT AND IMAGE INTENSIFICATION.
Monthly technical engineering rept. no. 24, 1-30 Jun 65,
by D. C. Fowlis, R. D. Harder, and Z. Szepesi. 13 Jul 65, 11p. Contract N61339 1440

Unclassified report

See also AD-605 191.

Descriptors: (*Image intensifiers (Electronics), Preparation), (*Photoelectric materials, Image intensifiers (Electronics)), Luminescence, Laminates, Photoconductivity, Cadmium compounds, Selenides, Powders, Oxychlorides, Sintering, Nitrogen, Light, Amplifiers

Series of experiments with sintered CdSe PC sandwich cells have been continued with the goal to eliminate the spotty structure, due to inhomogeneities and the formation of cadmium oxychloride during the sintering process. Small image intensifier panels have been fabricated using the test cells of above experiments. It was found that PC layers sintered mostly in nitrogen show much better image quality than those sintered in air atmosphere. (Author)

AD-620 418 See Fld. 8/2

AD-620 436 Div. 25/4 ,25/3
CFSTI Prices: HC $1.00 MF $0.50
COLUMBIA UNIV NEW YORK PLASMA LAB
APPLICATION OF THE QUENCHING OF HE AND NE METASTABLES BY OPTICAL RADIATION TO LASER MODULATION.
Quarterly status rept.,
by Thomas C. Marshall. 0 Apr 65, 12p. Contract Nonr26693

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Lasers, Plasma medium), (*Plasma medium, Quenching (Inhibition)), (*Helium, Atomic energy levels), (*Neon, Atomic energy levels), Discharge tubes, Radiofrequency, Excitation, Electron bombardment, Infrared radiation, Modulation

AD-620 461 See Fld. 14/5

AD-620 466 See Fld. 7/4

AD-620 469 Div. 25/4
SLOANE PHYSICS LAB YALE UNIV NEW HAVEN CONN
MEASUREMENT OF EXCITED STATE RELAXATION RATES,
by W. R. Bennett Jr., P. J. Kindlmann, and G. N. Mercer. 01965, 26p. Contract AF AFOSR626 64 Proj. 9767 Task 976702
AFOSR , 65-1122

Unclassified report

Pub. in Applied Optics Supplement 2 of Chemical Lasers p34-57 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Relaxation time, Electron transitions), (*Electron transitions, Relaxation time), (*Lasers, Electron transitions), Excitation, Helium group gases, Atomic energy levels, Probability, Time-to-pulse-height converters, Helium, Neon, Argon

A detailed review is given of methods for the measurement of radiative decay rates and total inelastic destructive cross sections of short-lived excited states. The paper is divided into six main sections, dealing with methods of approximate calculation and interpretation of radiative and collision processes; previous methods of measurement; a review of delayed multichannel coincidence techniques; properties of the vernier chronotron; methods of statistical analysis; and a summary and analysis of data pertinent to laser transitions in helium, neon, and singly ionized argon. The main emphasis is given to experimental techniques devised by the authors for the measurement of excited state lifetimes in the 4-nsec to 1000-nsec range and the analysis of data taken in the noble gases with this system. (Author)

AD-620 475 Div. 25/4
ROCHESTER UNIV N Y DEPT OF PHYSICS AND ASTRONOMY
DETERMINATION OF THE STATISTICAL PROPERTIES OF LIGHT FROM PHOTOELECTRIC MEASUREMENTS,
by E. Wolf, and C. L. Mehta. 12 Nov 64, 6p. Contract AF AFOSR237 63 Proj. 9767 Task 976702
AFOSR , 65-1114

Unclassified report

Pub. in Physical Review Letters v13 n24 p705-7 Dec 14 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Light, Intensity), (*Photoelectrons, Statistical distributions), (*Lasers, Light), Photoelectric effect, Probability, Integral transforms

It is shown that it is possible, in principle, to determine the complete probability density of the intensity in a fluctuating light beam from the knowledge of the statistical distribution of photoelectrons released from a photosensitive surface on which the beam is incident. Results indicate that the distribution of the photoelectrons is strictly poissonian if and only if the incident light is perfectly stabilized in the sense that the time-integrated intensity does not fluctuate. (Author)

AD-620 506 Div. 25/4 ,7/5
CFSTI Prices: HC $3.00 MF $0.75
HEBREW UNIV JERUSALEM (ISRAEL)
RESEARCH ON OPTICS OF SELECTIVE SURFACES.
Final rept. for 1 Jun 63-31 Oct 64,
by H. Tabor. 31 Oct 64, 74p. Contract AF61 052 659
AFCRL , 65-625

Unclassified report

See also AD-606 656.

Descriptors: (*Optics, Surfaces), (*Solar radiation, Absorption), (*Metal films, Optical properties), Optical filters, Mathematical analysis, Physical chemistry, Oxides

The report describes chemical, optical and mathematical investigations of thin absorbing films on metal substrates intended for solar energy absorbers. A detail discussion is included on the significance of selective surfaces for solar power production in space.

AD-620 507 See Fld. 3/1

AD-620 533 Div. 25/4
MCMASTER UNIV HAMILTON (ONTARIO) DEPT OF PHYSICS
EFFECT OF MAGNETIC-FIELD NONUNIFORMITIES ON THE FOCUSING OF A SECOND-ORDER DOUBLEFOCUSING MASS SPECTROMETER,
by R. C. Barber. 26 Nov 64, 9p. Contract AF AFOSR159 64 Proj. 9751 Task 975102
AFOSR , 65-1067

Unclassified report

Pub. in Canadian Journal of Physics, v43 p716-21 Apr 1965. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Mass spectroscopy, Spectrum analyzers), (*Spectrum analyzers, Focusing), Magnetic fields, Ions, Particle trajectories

The results of a numerical calculation investigating the effect of magnetic-field nonuniformities on the focusing of a second-order double-focusing mass spectrometer are reported. Because the image formed in previous experiments was so sharp, the aberrations were studied in the present investigation in finer detail than in former experiments. For each of the magnetic-field configurations considered, 9 ion trajectories were traced. Attention was confined to ions moving in the midplane of the magnetic field, and it was assumed that the field abruptly terminated at the boundaries. (Author)

AD-620 539 Div. 25/4
DENVER RESEARCH INST COLO
SPECTROMETER EFFECTS ON A LORENTZ LINE,
by Thomas G. Kyle, and Jay O. Green. 11 Feb 65, 1p. Proj. arpa order 363 62

Unclassified report

Pub. in Journal of the Optical Society of America, v55 n7 p895-6 Jul 1965. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Spectrum analyzers, Optical properties), Absorption spectrum, Resolution, Integration

AD-620 566 See Fld. 14/2

AD-620 613 See Fld. 14/2

AD-620 638 Div. 25/4 ,25/5
ILLINOIS UNIV URBANA
QUANTUM THEORY OF OPTICAL BEATING IN PHOTOCONDUCTORS,
by C. M. Penchina. 01964, 9p. Contract AF AFOSR714 65 Proj. 9763 Task 976302 AFOSR , 65-1191
Unclassified report

Pub. in proceedings of the International Conference Phys. Semicond. (7th), Paris, France, 19-24 Jul 64 p965-71 (Copies available only to DDC users).

Descriptors: (*Light, Interference), (*Lasers, Light), (*Photoelectric materials, Quantum mechanics), Photoconductivity, Optical properties, Resolution, Excitation, Electrical conductance

The quantum theory of optical beating in photoconductors is examined. A model is considered in which electrons, initially in a nearly filled band are optically excited to the next higher empty band. It is assumed that the energy gap between these two bands is much greater than kT. For ohmic material with a steady bias voltage, the change in current is proportional to the number of electrons excited by the radiation. Thus, to determine the photosignal, the total number of electrons excited by the radiation is calculated as a function of time. Results demonstrate that the recombination lifetime limits the resolution with which a photoconductive detector can distinguish between 2 light beams. (Author)

AD-620 685 Div. 25/4 ,25/6
CFSTI Prices: HC $2.00 MF $0.50
KORAD CORP SANTA MONICA CALIF
SOLID STATE LASER AMPLIFIER.
Quarterly progress rept. no. 8,
by J. H. Boyden, John Free, A. H. Gillmer, R. H. Hoskins, and R. C. Pastor. 0 May 65, 42p. Contract DA36 039AMC00070E Proj. DA 1P6 22001A056
Unclassified report

See also AD-424 737.

Descriptors: (*Lasers, Amplifiers), (*Amplifiers, Lasers), Gain, Ruby, Performance (Engineering), Oscillators, Interferometers, Brightness, Crystal growth, Yttrium compounds, Oxides, Impurities, Europium

Observations of the spatial non-uniformities of laser gain indicated that the origin of this effect is laser light trapped within the ruby rod. Experimental and theoretical work with laser amplifier systems resulted in the development of a 3000 MW amplifier system. Systems with output half-power pulsewidths in the 50 - 250 microsec range were also developed. The limits of achievable performance were investigated, with allowances made for technologically feasible improvements and differing amplifier and oscillator component configurations. Amplification of the output of a curved-mirror interferometer was shown to be the most practical approach for producing high-brightness and spikeless laser output. Y2O3:Eu (+3) crystals of 1/4-inch diameter and one-inch length were grown. Difficulties encountered in lasing suggest the use of Gd (+3) as an additive ion. (Author)

AD-620 733 See Fld. 20/12

AD-620 739 Div. 25/4 ,25/7
CFSTI Prices: HC $1.00 MF $0.50
KANSAS STATE UNIV MANHATTAN
SENSITIZED FLUORESCENCE.
Semiannual technical summary rept. for 1 Jan-30 Jun 65,
by Basil Curnutte Jr.. 30 Jun 65, 17p. Rept. no. SR-4
Contract Nonr363402 Proj. NR012 503,ARPA Order 306 62
Unclassified report

See also AD-611 756.

Descriptors: (*Mercury, Fluorescence), (*Fluorescence, Quenching (Inhibition)), (*Thallium, Quenching (Inhibition)), (*Lasers, Electron transitions), Atomic energy levels, Resonance, Excitation, Probability

The total deexcitation cross-section for the excited (63P1) state of mercury by thallium, as determined by quenching of resonance fluorescence, is given for three temperatures. Preliminary results on the cross-sections for excitation transfer from mercury to thallium are tabulated. (Author)

20/8. PARTICLE PHYSICS

AD-620 130 See Fld. 14/2

AD-620 141 See Fld. 7/2

AD-620 163 See Fld. 7/4

AD-620 169, See Fld. 20/6

AD-620 280 Div. 20/2 ,30/2
CFSTI Prices: HC $3.00 MF $0.75
DAVID TAYLOR MODEL BASIN WASHINGTON D C
TET 2, A THERMAL ENERGY TRANSPORT CODE.
Final rept.,
by Charles Dawson, and Philip E. Battey. 0 Jul 65, 65p. Rept. no. 1820
Proj. SR003 10 01 Task 10924
Unclassified report

Descriptors: (*Neutron transport theory, Programming (Computers)), (*Programming (Computers), Neutron transport theory), Thermal neutrons, Transport properties, Neutron scattering, Integral equations, Calculus of variations

TET 2 is a FORTRAN language digital computer program designed to produce numerical solutions to the Boltzmann Neutron Transport Equation. TET 2 was designed primarily for thermal neutron problems but it can also do slowing down problems. The derivation of the equations indicates a way in which equations with higher order spatial terms may be derived. (Author)

AD-620 289 Div. 20/1 ,20/6 ,25/4
CFSTI Prices: HC $2.00 MF $0.50
MASSACHUSETTS INST OF TECH CAMBRIDGE LAB FOR INSULATION RESEARCH
ELECTRON-IONIZATION CROSS SECTIONS.
Semiannual progress rept. no. 4, 16 Dec 64-15 Jun 65,
by C. K. Crawford, and F. M. Roddy. 15 Jun 65, 29p. Contract AF33 657 10939
Unclassified report

Descriptors: (*Gas ionization, Measurement), (*Ion sources, Mass spectroscopy), (*Electron guns, Resolution), Ionization chambers, Electron beams

Construction of a new crossed beam ion source is described in considerable detail. The source is the first to take advantage of the new parts and incorporates the first wire-wound ionization chamber with all sides flashable. Work continued on the electron monochromators. (Author)

AD-620 295 See Fld. 9/2

AD-620 384 Div. 20/2
CFSTI Prices: HC $3.00 MF $0.50
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF
HALF-LIFE MEASUREMENTS OF SOME NEUTRON INDUCED ISOMERS.
Master's thesis,
by Edward J. Button, and Thomas M. Smith. 01965, 55p.
Unclassified report

Descriptors: (*Half life, Nuclear isomers), (*Nuclear isomers, Half life), Thermal neutrons, Hafnium, Ytterbium, Tungsten

Half-lives of thermal neutron activated isomers were determined by direct decay measurements with a scintillation counter. Scaler pulses following a single channel analyzer, together with precise timing pulses, were traced concurrently by a fast chart recorder. The gain stability of the detecting circuit was also monitored during the decay period. Decay counts were corrected for counting circuit dead-time and for pulse pile-up, and analyzed by a digital computer. The average half-lives obtained, together with their statistical uncertainties are: Hf178m 3.79 = 0.07 sec., Hf179m 18.18 = 0.28 sec., Yb177m 6.40 = 0.02 sec., W183m 5.14 = 0.02 sec. (Author)

AD-620 424 See Fld. 7/4

AD-620 425 See Fld. 7/4

AD-620 449 See Fld. 14/2

AD-620 470 Div. 20/1 ,25/5
NEW SOUTH WALES UNIV SYDNEY (AUSTRALIA)
EXPECITATION VALUES OF VARIOUS OPERATORS IN THE TRITON,
by L. M. Delves. 14 May 64, 5p. Contract AF AFOSR62 400
Unclassified report

Pub. in Physical Review v135 n6B pB1316-9 Sep 21 1964 (Copies not available to DDC or Clearinghouse customers). Prepared in cooperation with Courant Inst. of Mathematical Sciences, New York Univ., N. Y.

Descriptors: (*Tritons, Operators (Mathematics)), (*Operators (Mathematics), Mathematical prediction), Quantum mechanics, Probability, Nuclear binding energy

The trial functions used in a calculation of the triton binding energy with realistic forces have been used to derive the expectation values of a number of operators. These include the Coulomb energy for point and for finite protons; various products of powers of the interparticle distances; and the charge and magnetic moment form factors as given by Schiff. (Author)

AD-620 471 Div. 20/2
NEW SOUTH WALES UNIV SYDNEY (AUSTRALIA)
AN UPPER BOUND ON THE NEUTRON-DEUTERON S SCATTERING LENGTH,
by L. M. Delves, J. N. Lyness, and J. M. Blatt. 13 Apr 64, 3p. Contract AF AFOSR62 400 AFOSR , 65-1125
Unclassified report

Pub. in Physical Review Letters v12 n19 p542-4 May 11 1964 (Copies not available to DDC or Clearinghouse customers). Prepared in cooperation with New York Univ., N. Y.

Descriptors: (*Neutron scattering, Deuteron reactions), (*Deuteron reactions, Neutron scattering), Nuclear spins, Nuclear forces, Calculus of variations

AD-620 478 Div. 25/7
CALIFORNIA UNIV BERKELEY DEPT OF PHYSICS
FINE STRUCTURE OF HELIUM,
by Charles Schwartz. 6 Jan 64, 9p. Contract AF AFOSR130 63 Proj. 9767 Task 976701
AFOSR, 65-1110
Unclassified report

Pub. in the Physical Review v134 n5A pA1181-7 Jun 1 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Helium, Atomic spectroscopy), (*Atomic spectroscopy, Helium), Atomic energy levels, Atomic orbitals, Quantum mechanics, Theory, Numerical methods and procedures

Under the expectation that experiments will soon give values for the fine structure intervals of the 2 (3)P state of helium to an accuracy of 1/10 to the 6th power, a program of calculations was undertaken which, it is hoped, will lead to a new determination of the fine-structure constant alpha. This paper gives a brief survey of the over-all program, and a detailed report of the successful completion of the first task: the construction of approximate solutions to the Schrodinger equation which lead to average values of the leading fine structure operators accurate to about one part per million. (Author)

AD-620 482 See Fld. 6/1

AD-620 510 Div. 20/2
CFSTI Prices: HC $3.00 MF $0.75
GENERAL ATOMIC DIV GENERAL DYNAMICS CORP SAN DIEGO CALIF
DELAYED GAMMA RAYS FROM FISSION.
Final rept. for 12 Mar 64-30 Apr 65,
by R. B. Walton, and R. E. Sund. 0 Sep 65, 62p. Rept. no. GA-6445
Contract AF29 601 6358 Proj. 5710 Task DASA 04 097
WL, TR-65-95
Unclassified report

Descriptors: (*Fission, Gamma-ray spectra), (*Gamma rays, Fission products), Uranium, Plutonium, Energy, Intensity, Bremsstrahlung, X rays, Isomeric transitions, Neutron reactions

Studies of delayed gamma rays from fission at early times were conducted using the pulsed beams of neutrons and bremsstrahlung x rays from an electron linear accelerator to produce fissions. Measurements of the energy spectrum of isomeric gamma rays from the neutron fission of Pu239 and U235 were performed. The intensities of delayed gamma rays from the neutron fission of U235 and Pu239 were measured as a function of time between 60 microsec and 30 msec. Results of the spectrum and intensity measurements gave a complete description of delayed gamma rays from U235 (n, F) and Pu239 (n, F) for the time interval from 50 microsec to 30 msec. The intensities of delayed gamma rays from photofission of U235, Pu239, and U238 were measured at early times, starting at 2 microsec after fission. An intense short-lived component with an apparent half-life of a few usec was observed for all three cases of photofission. For both U235 and Pu239, the intensity of delayed gamma rays in the isomeric time region from photofission is almost the same as that from neutron fission but is appreciably lower in the plateau region. (Author)

AD-620 517 Div. 20/1
CALIFORNIA INST OF TECH PASADENA
AN ISOSPIN 3/2 LEVEL OF BE9,
by B. Lynch, G. M. Griffiths, and T. Lauritsen. 26 Oct 64, 6p. Contract Nonr22047
Unclassified report

Pub. in Nuclear Physics v65 p641-6 1965 (Copies available only to DDC users).

Descriptors: (*Beryllium, Nuclear energy levels), (*Nuclear spins, Beryllium), Excitation, Parity, Selection rules, Differential cross section

A state of Be9 has been found at an excitation energy of 14.392=0.005 MeV, with a width less than 5 keV. The state is formed in the reaction Li7 (He3, p)Be9 and corresponds closely in energy to the expected analogue of the ground state of Li9. These facts, together with the small width, suggest an assignment of T = 3/2. The angular distribution of protons corresponding to the 14.39 MeV state is nearly symmetric about 90 degrees in the centre-of-mass with maxima at 40 degrees and 150 degrees. The 90 degree differential cross sections are approximately the same for 6.5 and 10 MeV He3, with a minimum value between these energies. The total cross sections for 10 MeV He3 and 7.5 MeV are given. (Author)

AD-620 586 Div. 20/2
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
A STUDY OF MULTIPLE COMPTON SCATTERING,
by W. R. Faust, C. Fiddler, and M. H. Johnson. 26 Mar 48, 16p. Rept. no. NRL-3265
Unclassified report

Previously announced 2 June 53 as PB-111 121, LC mi$2.00, ph$2.75.

Descriptors: (*Compton scattering, Gamma rays), (*Gamma rays, Compton scattering), Water, Radioactive isotopes, Shielding, Cobalt, Distribution, Intensity, Geiger counters

An experimental and theoretical investigation was made of the gamma-radiation in water produced by a uniform distribution of radioactive cobalt. The intensity and spectral distribution of the radiations are determined essentially by the multiple Compton scattering that takes place in the liquid. An approximate quantitative treatment is presented in which the multiple scattering is considered as a succession of steps which are the same for every emitted gamma-ray. Although the method is quite crude, the numerical results both for the absolute counting rate of a submerged counter and for the effect of shielding around the counter are in close agreement with experiment. (Author)

AD-620 623 See Fld. 20/12

AD-620 630 See Fld. 7/4

AD-620 631 See Fld. 7/2

AD-620 639 Div. 20/2
PALMER PHYSICAL LAB PRINCETON UNIV N J
BOUNDS FOR A CLASS OF BETHE-SALPETER EMPLITUDES,
by George Tiktopoulos. 12 Nov 64, 9p. Contract AF49 638 1333 Proj. 9751 Task 975102
AFOSR, 65-1063
Unclassified report

Pub. in Physical Review v137 n6B pB1597-602 Mar 22 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Elastic scattering, Nuclear models), Nucleons, Inequalities

For a certain wide class of kernels involving trilinear coupling of scalar particles, the absorptive part of the Bethe-Salpeter amplitude for forward scattering is bounded from above and below. The bounds are expressed in the form B S (D)<A (S)<C S (E), where S is the scattering energy and B and C are positive constants. Expressions for the exponents D and E are given as functions of the coupling constant g. For the straightladder model, D and E coincide for all values of g, the common expression agreeing with an exact result of Nakanishi. For the more complicated models, D and E do not in general coincide. However, in the strongcoupling limit g approaches infinity, it is found that D/E approaches 1; moreover, the common asymptotic behavior D,E approaches g approaches infinity g/4piM is the same for all the models, including the straightladder model. (Author)

AD-620 640 Div. 20/2 ,20/6
PALMER PHYSICAL LAB PRINCETON UNIV N J
FLUCTUATIONS WITH TIME OF SCATTERED-PARTICLE INTENSITIES,
by M. L. Goldberger, and K. M. Watson. 19 Oct 64, 17p. Contract AF49 638 1333 Proj. 9751 Task 975102
AFOSR, 65-1064
Unclassified report

Supported in part by Atomic Energy Commission, Washington, D. C. Pub. in Physical Review v137 n5B pB1396-409 Mar 8 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Elementary particles, Nuclear scattering), (*Count-rate meters, Elementary particles), Intensity, Electromagnetic waves, Correlation techniques, Statistical functions

The fluctuations in counting rate of a particle detector are studied. These may be used to study the coherence properties of the beam. For the case of electromagnetic radiation they may be used to study spectral line shapes. The fluctuations in intensity of scattered particles provide a means of studying fluctuation phenomena in the target. (Author)

AD-620 644 Div. 20/2 ,20/3
LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF RESEARCH LABS
CYCLOTRON RESONANCE ECHO.
Technical rept.,
by R. M. Hill, and E. D. Kaplan. 17 May 65, 6p. Rept. no. TR-6
Contract Nonr254100 Proj. NR048 125
Unclassified report

Pub. in Physical Review Letters v14 n26 p1062-3 Jun 28 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Cyclotron resonance phenomena, Electromagnetic wave reflections), Plasma physics, Electrons, Spin, Microwave frequency

The discovery of cyclotron echo effects from free electrons in ionized gases is reported. A brief description of the experiment is given and some preliminary conclusions regarding the physical significance of the decay time constants for two- and three-pulse echoes are presented. (Author)

AD-620 698 Div. 20/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
THE COMPTON EFFECT ON A MOVING ELECTRON,
by V. A. Tumanian. 2 Aug 65, 15p. Rept. no. FTD-MT-65-36
TT, 65-63810
Unclassified report

Edited machine trans. of mono. Voprosy Fiziki Elementarnykh Chastits, Erevan, 1963 p464-73. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Compton scattering, Electrons), (*Electrons, Compton scattering), Quantum mechanics, Photons, Polarization, USSR

An interesting peculiarity of the Compton effect on a moving electron is the appearance in the process of scattering of photons harder than the pho-

tons being scattered. Due to this, even in the case of scattering of light photons on extremely relationistic electrons, the already scattered photons will possess energies comparable with the energies of the electrons. This peculiarity of Compton scattering can be of practical interest from the point of view of obtaining beams of hard gamma-quanta on high-energy electron accelerators. It is important to note that characteristics of such gamma-beams will sharply differ from usual characteristics obtained during deceleration of electrons in matter.

AD-620 713 See Fld. 14/2

AD-620 714 Div. 20/1 ,8/4
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
ROTATIONAL-BEAM POWER THEOREMS,
by Paul Penfield,Jr.. 12 May 64, 6p. Contract DA36 039AMC03200E

Unclassified report

Pub. in IEEE Transactions on Electron Devices vED12 n5 p258-63 May 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Electron beams, Rotation), Power, Theorems, Plasma physics, Polarization, Vector analysis, Calculus of variations

General power theorems for rotational electron beams and some moving plasmas are derived by using three sets of variables: Clebsch variables, Lin's variables, and polarization variables. In each case, the most general power theorem, with unspecified linear operators, is given and for the polarization-variable case this is specialized to some cases of interest. Unfortunately, the physical interpretation of the variables used is not always clear, and the physically unmeasurable variables may not always behave as measurable ones would, so that the theorems are of limited usefulness. (Author)

AD-620 732 Div. 20/1 ,20/2 ,25/8 ,25/2
CFSTI Prices: HC $1.00 MF $0.50
EMMANUEL COLL BOSTON MASS RESEARCH LANGUAGE CENTER
ACT PHYSICA SINICA, VOL. 20, NO. 2, 1964: TABLE OF CONTENTS AND ABSTRACTS.
0 Jun 64, 8p. Rept. no. E-TC-Ch-64-24
Contract AF19 628 3869
TT , 65-63811

Unclassified report

Abstract trans. of Wu Li Hsueh Pao (Chinese Peoples Republic) v20 n2 p1-96 1964.

Descriptors: (*Physics, Abstracting), China, Cerenkov radiation, Nuclear spins, Crystal structure, Elementary particles, Perturbation theory, Thermal conductivity, Nuclear properties, Raman spectroscopy

Abstracts are given for: Cherenkov radiation of charged particles with an oriented spin; The nonaxiallysymmetric rotational motion of odd-A nuclei Mg25 and A125; The possibility of the application of the F (11) function in the structural analysis of crystals in comparison with the Patterson-function method; The radiative decay of an omega particle; A perturbation method for heat conduction problems with cylindrical air gaps; The Brueckner-Goldstone linked cluster expansion formula; The effect of anharmonic members in the oscillation of spherical nuclei; The Raman effect of the multiple radiation process and its application to spectroscopy.

AD-620 733 See Fld. 20/12

AD-620 739 See Fld. 20/6

AD-620 750 Div. 20/2
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO)
THE GE73 (N, ALPHA)ZN70 REACTION AT 14 MEV OBSERVED IN A LITHIUM DRIFTED GERMANIUM DETECTOR,
by J. H. Aitken, and W. R. Dixon. 1 Dec 64, 6p. Rept. no. NRC-8382

Unclassified report

Pub. in Nuclear Physics v67 p395-400 1965 (Copies available only to DDC users).

Descriptors: (*Neutron reactions, Germanium), (*Alpha decay, Zinc), Nuclear energy levels, Pulse height analyzers, Semiconductor devices, Lithium

The (n, alpha) reactions induced in germanium by 14 MeV neutrons have been observed in a germanium semiconductor detector. Values of the cross section of the ground-state transition of Ge73 (n, alpha)Zn70 at 14.1 and 14.8 MeV are presented along with possible evidence for the existence of excited states of Zn70 at 1.95=0.1 MeV and at 2.3=0.1 MeV. Evidence for a reduced response of the detector to the Zn recoil atoms is discussed. (Author)

AD-620 779 Div. 20/2
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF PURE PHYSICS
THE (P, P ALPHA) AND (ALPHA, 2 ALPHA) REACTIONS AT MEDIUM ENERGY,
by Y. Sakamoto. 7 Sep 64, 15p. Rept. no. NRC-8386

Unclassified report

Pub. in Nuclear Physics v66 n3 p531-44 1965 (Copies available only to DDC users).

Descriptors: (*Proton reactions, Alpha particle reactions), (*Alpha particle reactions, Proton reactions), Alpha decay, Nuclear structure, Nucleons, Carbon, Beryllium

A formalism is presented for (p, p alpha) and (alpha, 2 alpha) reactions for incident particles of medium energy. The (alpha, 2 alpha) reaction is very similar to the (p, p alpha) reaction. Both reactions are treated in terms of the momentum distribution of the centre-of-mass of the alpha-particle cluster and of the extent of alpha-particle clustering of nucleons inside the nucleus. The interactions between the incident particles and the alpha-particle cluster inside the nucleus are determined from free p-alpha and alpha-alpha scattering. The wave function of the alphaparticle cluster is constructed from single-particle harmonic-oscillator wave functions for the nucleons in the nucleus. As examples the C12 (p, p alpha) and Be9 (alpha, 2 alpha) reactions are studied by using this wave function. (Author)

20/10. QUANTUM THEORY

AD-620 189 See Fld. 20/12

AD-620 364 See Fld. 20/3

AD-620 458 Div. 25/5 ,25/6
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP SANTA MONICA CALIF
THE ENERGY MECHANICS OF SEMISTATIC SPACETIMES,
by Dominic G. B. Edelen. 0 Sep 65, 37p. Rept. no. RM-4484-PR
Contract AF49 638 700

Unclassified report

Descriptors: (*Mechanics, Tensor analysis), (*Relativity theory, Mechanics), Energy, Time, Gravity, Field theory, Topology, Geodesics, Statics

A unique characterization of 4-dimensional, hyperbolic normal metric, or semistatic spaces, E, is given in terms of the admissible forms of the metric tensor. If the Einstein field equations are assumed to hold in E, the most general form of the momentum-energy tensor that supports a semistatic energy mechanics is obtained. It is shown that all cosmological line elements previously considered are conformally equivalent to a semistatic space in which the metric tensor on the hypersurfaces orthogonal to a time-oriented normal congruence in E, K, is Euclidean. All physical quantities can be determined in terms of the metric and curvature of the hypersurfaces orthogonal to K and one additional function of all four coordinates. These determinations are exhibited and provide a means whereby the hypersurface geometry is uniquely determinable in terms of the projection of the momentum-energy tensor onto the hypersurface. The treatment concludes with the study of a semistatic perfect fluid. (Author)

AD-620 470 See Fld. 20/8

AD-620 486 Div. 25/5
FLORIDA UNIV GAINESVILLE DEPT OF PHYSICS AND ASTRONOMY
ON THE DEGENERACY OF THE TWO-DIMENSIONAL HARMONIC OSCILLATOR,
by Victor A. Dulock, and Harold V. McIntosh.
16 Dec 63, 12p. Contract AF AFOSR471 64
Proj. 9767 Task 976701
AFOSR , 65-1119

Unclassified report

Pub. in American Journal of Physics, v33 n2 p109-18 Feb 1965. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Harmonic oscillators, Mechanics), Motion, Damping, Quantum mechanics, Mathematical analysis, Hamiltonian, Differential equations

A further study of the degeneracy of the two dimensional harmonic oscillator is made, both in the isotropic and anisotropic cases. By regarding the Hamiltonian as a linear operator acting through the Poisson bracket on functions of the coordinates and momenta, a method applicable generally to bilinear Hamiltonians, it is shown how all possible rational constants of the motion may be generated. They are formed from eigenfunctions of the Hamiltonian which are linear combinations of the coordinates and momenta, and which belong to negative pairs of eigenvalues. Canonical coordinates, which may be visualized geometrically for the isotropic oscillator in terms of the Hopf mapping, place the symmetry group responsible for the accidental degeneracy clearly in evidence. Surprisingly, it is found that the unitary unimodular group SU sub 2, is the symmetry group in all cases, even including that of an anisotropic oscillator with incommensurable frequencies. The lack of a quantum-mechanical analogy in the latter case is due to a lack of the necessary transcendental roots of the operators involved in attempting to use the correspondence principle, rather than to the lack of a symmetry group for the classical problem. (Author)

AD-620 494 See Fld. 8/14

AD-620 638 See Fld. 20/6

AD-620 794 Div. 25/5
AEROSPACE RESEARCH LABS OFFICE OF AEROSPACE RESEARCH WRIGHT-PATTERSON AFB OHIO
APPROXIMATION OF THE DIRAC DENSITY MATRIX,
by Herbert Payne. 22 Jun 64, 4p. Rept. no. ARL-65-147

Unclassified report

Pub. in The Journal of Chemical Physics v41 n11 p3650-1 1 Dec 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Matrix algebra, Quantum mechanics), (*Quantum mechanics, Matrix algebra), Fermions, Series

The properties of a fermion system in the ground state, in the one particle approximation, are determinable from the Dirac density matrix. An improved formula for the Dirac density matrix, containing a correction for grad V, is proposed.

20/12. SOLID STATE PHYSICS

AD-620 103 Div. 25/6 ,15/1
CFSTI Prices: HC $2.00 MF $0.50
MATHEMATICS RESEARCH CENTER UNIV OF WISCONSIN MADISON
THE CALCULATION OF EQUILIBRIUM STATES OF ELASTIC BODIES BY NEWTON'S METHOD.
Technical summary rept.,
by H. F. Bueckner, M. W. Johnson Jr., and R. H. Moore. 0 Jun 65, 28p. Rept. no. MRC-TSR-565
Contract DA11 022ORD2059

Unclassified report

Descriptors: (*Elastic shells, Deformation), (*Iterative methods, Deformation), Buckling (Mechanics), Elasticity, Nonlinear differential equations

The numerical calculation of equilibrium states of elastic bodies under large deformation, where the governing differential equations are nonlinear, is considered. Newton's iterative method is modified by a reparametrization scheme which makes it possible to obtain a global solution in problems where buckling occurs. The method is applied to the problem of the buckling of a shallow clamped spherical shell under uniform pressure. (Author)

AD-620 104 Div. 25/6 ,15/1
CFSTI Prices: HC $3.00 MF $0.75
MATHEMATICS RESEARCH CENTER UNIV OF WISCONSIN MADISON
OPTIMAL REGULATION OF LINEAR SYMMETRIC HYPERBOLIC SYSTEMS WITH FINITE DIMENSIONAL CONTROLS.
Technical summary rept.,
by David L. Russell. 0 May 65, 63p. Rept. no. MRC-TSR-566
Contract DA11 022ORD2059

Unclassified report

Descriptors: (*Optimization, Control systems), (*Partial differential equations, Motion), Nonlinear programming, Boundary value problems, Matrix algebra, Heat transfer, Deformable projectiles

Finite dimensional control of a class of linear symmetric hyperbolic systems of partial differential equations is considered. The control criterion is minimization of the energy of the system at a given time T after the exercise of control is begun. It is shown that the optimal control exists and satisfies a maximum principle. A type of normality condition is discussed. It is shown that a class of boundary value control problems can be treated in this setting. Some numerical procedures are suggested. (Author)

AD-620 112 Div. 25/6 ,4/4 ,25/2
CFSTI Prices: HC $2.00 MF $0.50
IMPERIAL COLL OF SCIENCE AND TECHNOLOGY LONDON (ENGLAND) DEPT OF CHEMISTRY
PHOTOCHEMICAL REACTIONS IN THE ALKALI HALIDES.
Final technical rept.,
by P. W. M. Jacobs, and O. E. Facey. 0 Aug 65, 39p. Contract N62558 3549 Proj. NR018 707

Unclassified report

Descriptors: (*Color centers, Photochemistry), (*Photochemistry, Color centers), (*Potassium compounds, Color centers), Alkali metal compounds, Halides, Chlorides, Crystals, Impurities, Sulfides, Deuterated compounds, Band spectrum, Quenching (Inhibition), Great Britain

The work described in the report is concerned principally with the kinetics of formation of the various centres formed in HS (-) and DS (-) doped KCl crystals and subsequent thermal bleaching of their absorption bands. The halfwidths of the 193 and 255 millimicron bands were measured down to liquid helium temperature in an attempt to discover if the species responsible for the two absorption bands have a common ground state.

AD-620 118 Div. 25/6
CFSTI Prices: HC $1.00 MF $0.50
NORTHWESTERN UNIV EVANSTON ILL DEPT OF MATERIALS SCIENCE
RATE OF GROWTH OF FATIGUE CRACKS AS CALCULATED FROM THE THEORY OF INFINITESTIMAL DISLOCATIONS DISTRIBUTED ON A PLANE.
Technical rept.,
by J. Weertman. 2 Aug 65, 21p. Rept. no. TR-1
Contract Nonr122832 Proj. NR039 086

Unclassified report

Descriptors: (*Fracture (Mechanics), Theory), Fatigue (Mechanics), Crystal lattice defects, Statistical functions, Integration, Stresses

The Bilby, Cottrell and Swinden crack theory is applied to the problem of the growth of fatigue cracks. It is found that if a total critical displacement is adopted as the fracture criterion, the theory leads to observed growth laws. (Author)

AD-620 161 **See Fld. 11/6**

AD-620 189 Div. 25/6 ,25/5 ,25/3
CFSTI Prices: HC $2.00 MF $0.50
MARYLAND UNIV COLLEGE PARK DEPT OF PHYSICS AND ASTRONOMY
ELECTRON-PHONON RENORMALIZATION EFFECTS IN HIGH MAGNETIC FIELDS. THE DE HAAS-VAN ALPHEN EFFECT.
Technical rept.,
by M. Fowler, and R. E. Prange. 10 Mar 65, 26p. Rept. no. TR-443
Contract AF AFOSR735 65
AFOSR , 65-1192

Unclassified report

Descriptors: (*Electrons, Phonons), (*Phonons, Electrons), (*Field theory, Metallic crystals), Magnetic fields, Cyclotron waves, Perturbation theory, Quantum mechanics, Atomic energy levels

When a metal is placed in a sufficiently strong magnetic field, it is to be expected that the effective mass of the electrons due to electron phonon interactions will be modified. The condition that the field will be strong enough to have an effect is that the cyclotron frequency be comparable to phonon frequencies. It is expected that such effects may be observable with experimentally realizable fields in some special cases. The amplitude dependence of the de Haas-van Alphen effect was calculated as a function of temperature and magnetic field. This amplitude can be interpreted as giving a field dependent effective mass. The amplitude was calculated numerically for several cases of interest. It is found that the field effects are rather smooth and depend most directly on the electron selfenergy function for pure imaginary values of the frequency. (Author)

AD-620 207 **See Fld. 20/6**

AD-620 270 Div. 25/6
CFSTI Prices: HC $1.00 MF $0.50
WESTINGHOUSE ELECTRIC CORP PITTSBURGH PA DEPT OF SOLID STATE PHENOMENA
THERMAL CONDUCTIVITY AND THERMOELECTRIC POWER OF SOLIDS AT LOW TEMPERATURES.
Final rept. for 1 Jun 62-31 May 65,
by Paul G. Klemens. 31 May 65, 10p. Contract AF49 638 1165 Proj. 9763 Task 976302
AFOSR , 65-1485

Unclassified report

Descriptors: (*Gold alloys, Conductivity), (*Thermal conductivity, Gold alloys), (*Thermoelectricity, Gold alloys), Resistance (Electrical), Electrical conductance, Low-temperature research, Scattering, Electrons, Crystal lattices, Glass, Photons, Tin alloys, Antimony alloys, Platinum alloys, Tellurium alloys, Solid solutions

Thermal conductivity and thermoelectric power of solids were investigated at low temperatures. Photonassisted scattering of electrons by the impurity atoms was first studied and the electrical resistivity of a number of gold alloys was measured from 2-401K. Experiments demonstrated the reality of resistance due to phononassisted inelastic impurity scattering and verified the theoretical magnitude and temperature dependence of the effect. Alloys having localized lattice modes were considered and a precise determination of the temperature dependence of the electrical resistivity of gold is given. Electrical and thermal conductivities and thermoelectric power were studied in the semi-metals of tin-telluride and platinum-antimonide. The role of resonance scattering of phonons in the thermal conductivity of glasses is discussed. (Author)

AD-620 297 Div. 25/6
CFSTI Prices: HC $6.00 MF $1.25
CLEVITE CORP CLEVELAND OHIO ELECTRONIC RESEARCH DIV
RESEARCH ON II-VI COMPOUND SEMICONDUCTORS.
Final technical rept. for 1 Jan 62-31 Jan 65,
by L. R. Shiozawa, and J. M. Jost. 0 May 65, 215p. Contract AF33 657 7399 Proj. 7885 Task 788503
ARL , 65-98

Unclassified report

Descriptors: (*Semiconductors, Materials), (*Crystal growth, Semiconductors), (*Luminescence, Semiconductors), Cadmium alloys, Cadmium compounds, Zinc alloys, Sulfides, Selenium alloys, Tellurium alloys, Purification, Sintering, Crystal lattice defects, Electrical properties, Mechanical properties, Phase studies, Solid solutions, Deformation, Intermetallic compounds

The report summarizes three years of research on material purification and crystal growth of CdS, CdSe, ZnTe, and CdSe-ZnSe and on the measurement of the fundamental properties of the crystals. In addition, a preliminary investigation has been made into the luminescent phenomena in CdS.

AD-620 334 Div. 25/6
CFSTI Prices: HC $3.00 MF $0.75
IIT RESEARCH INST CHICAGO ILL TECHNOLOGY CENTER
DEVIATORIC EFFECTS IN HIGH INTENSITY STRESS WAVES.
Technical rept. for 19 Mar 63-20 Nov 64,
by E. L. McDowell. 0 Aug 65, 76p. Contract AF29 601 5008 Proj. 5710 Task 13 144
WL , TR-65-15

Unclassified report

Descriptors: (*Solid state physics, Shock waves), (*Shock waves, Solid state physics), (*Mechanics, Shock waves), Spheres, Continuum mechanics, Elasticity, Plasticity, Stresses, Deformation, Hydrostatics, Solids

The governing equations for dynamic cavity expansion are developed for continua which can be characterized as compressible elasto-plastic, and kinematic hardened. A numerical procedure for integrating these governing equations, utilizing shock-fitting as opposed to artificial viscosity for numerical stability, is outlined. The shockfitting, as well as the starting procedure, is based on a progressive wave solution of an adjunct problem which is asymptotic to the formulated problem. Continua theory of dynamic cavity expansion, as formulated here, indicates that the hydrostatic component of the stress state decreases much more rapidly than a decreasing cavity pressure as

long as the cavity is expanding. The capability of a continuum to transmit radial compressive force is due to a rapidly increasing deviatoric stress. (Author)

AD-620 337 Div. 25/6
CFSTI Prices: HC $1.00 MF $0.50
NORTHWESTERN UNIV EVANSTON ILL DEPT OF MATERIALS SCIENCE
LOW TEMPERATURE CREEP DEFORMATION OF CRYSTALS PARTICULARLY PHENOMENA AT LIQUID HELIUM TEMPERATURES.
Final rept. for 1 Mar 60-1 Mar 65,
by Anthony Arko, and Johannes Weertman. 1 Jun 65, 13p. Contract AF49 638 1041 Proj. 9763 Task 976301
AFOSR , 65-1484

Unclassified report

Descriptors: (*Cryogenics, Creep), (*Cadmium, Creep), (*Creep, Cryogenics), (*Mercury, Creep), Deformation, Low-temperature research, Heat of activation, Volume, Single crystals

Creep behavior of cadmium and mercury were investigated in the liquid helium temperature range with emphasis on the possible mechanisms of creep. Creep was found to be temperature dependent at all temperatures of investigation down to 1.75 K, and impurities in the metals had no noticeable effects. Activation energies were determined in the range 1.75-30 K and activation volume measurements were carried out. Creep behavior in the liquid temperature range was found to differ little from the usual low temperature creep at higher temperatures. At liquid helium temperatures, however, creep did not follow low temperature theories, but correction could be made by Alefeld's new rate equation for processes at low temperatures. Quantum tunneling effects on creep were found to be unimportant at temperatures above 0.04 K. (Author)

AD-620 393 Div. 25/6 ,17/2
CFSTI Prices: HC $2.00 MF $0.50
PHILCO RESEARCH LABS NEWPORT BEACH CALIF
PLASTIC STRAINS AND ENERGY DENSITY IN CRACKED PLATES. PART I. EXPERIMENTAL TECHNIQUE AND RESULTS,
by W. W. Gerberich. 01964, 34p.

Unclassified report

Continuation of work begun at Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena under contract NAS7 100. Presented at SESA Spring Meeting, Salt Lake City, Utah, May 6-8, 1964.

Descriptors: (*Metal plates, Plasticity), (*Strain (Mechanics) Metal plates), Fracture (Mechanics), Experimental data, Deformation, energy

A technique is presented which allows separation of the principal plastic strains within an enclave at a crack tip in relatively thin plates. For plates with a number of crack lengths, several degrees of tensile loading are applied to five ductile materials with widely varying mechanical properties. Principal plastic strain distributions, plastic distortional strain energy density and total plastic energy are determined within the resulting plastic enclaves. It is shown that the degree of loading and strain-hardening greatly affect the principal plastic strain and energy density distributions and that this is reflected in the amount of strain energy that can be plastically absorbed at a crack tip. (Author)

AD-620 443 Div. 25/6 ,4/4 ,25/2
CFSTI Prices: HC $1.00 MF $0.50
IMPERIAL COLL OF SCIENCE AND TECH LONDON (ENGLAND)
PHOTOCHEMICAL REACTIONS IN THE ALKALI HALIDES.
Status rept. no. 3, 1 Apr-30 Jun 65,
by P. W. M. Jacobs. 1 Jul 65, 4p. Contract N62558 3549

Unclassified report

Descriptors: (*Color centers, Photochemistry), (*Photochemistry, Color centers), (*Potassium compounds, Color centers), Alkali metal compounds, Halides, Chlorides, Crystals, Impurities, Hydrogen compounds, Deuterated compounds, Sulfides, Crystal growth, Chemical equilibrium, Reaction kinetics, Band spectrum, Great Britain

KCl was doped with DS (-) ions by growing the crystal under deuterium in a sealed quartz vessel which also contains some sulphur. The equilibrium, 2D2 + S2 reversibly yields 2D2S, then favours the reaction of D2S with molten KCl. The kinetics of photolysis of the HS (-) and DS (-) ions were studied and also the kinetics of bleaching of the Hi (0) and Di (0) bands (Hi (0) = interstitial hydrogen atom).

AD-620 450 Div. 25/6
CFSTI Prices: HC $3.00 MF $0.75
KANSAS STATE UNIV MANHATTAN
AN INVESTIGATION OF SURFACE STATES ON SILICON EMPLOYING THE MOS CAPACITANCE METHOD.
Master's thesis,
by Donald W. Roberds. 0 Jun 65, 97p. Contract AF33 608 1076

Unclassified report

Descriptors: (*Silicon, Surface properties), (*Surface properties, Crystal lattice defects), (*Capacitance, Surface properties), Atomic energy levels, Semiconductors, Space charges, Metals, Oxides, Diodes (Semiconductor), Capacitors, Potential theory

The MOS (metal-oxide- semiconductor) device was used to measure the density and position within the forbidden gap of surface states on silicon. The theory of the silicon space charge is discussed and an equation for this charge is derived, relating it to the voltage drop across the silicon. The MOS structure, fabrication, and variation of capacity with d. c. bias voltage are discussed. Experimental results are presented of the determination of surface state density versus position in the band gap.

AD-620 458 **See Fld. 20/10**

AD-620 465 Div. 25/6
CFSTI Prices: HC $1.00 MF $0.50
POLYTECHNIC INST OF BROOKLYN N Y
ELECTROMAGNETIC PROPERTIES OF METALS AND SEMICONDUCTORS.
Status rept. for 1 Apr-1 Jul 65.
1 Jul 65, 4p. Contract Nonr83937 Proj. NR017 424

Unclassified report

See also AD-600 681.

Descriptors: (*Electromagnetic properties, Metal films), (*Semiconductors, Electromagnetic properties), Silver, Paramagnetic materials, Field theory, Hall effect

The status of research on: (1) the metallic field effect and the properties of thin silver films; and (2) galvanomagnetic properties of paramagnetic metals is presented.

AD-620 477 **See Fld. 20/2**

AD-620 480 Div. 25/6
CALIFORNIA UNIV LA JOLLA DEPT OF PHYSICS
SUPERCONDUCTIVITIES NEAR IMPURITIES,
by D. R. Fredkin, J. S. Langer, B. T. Matthias, and H. Suhl. 01963, 2p. Contract AF AFOSR631 64
AFOSR , 65-1190

Unclassified report

Pub. in Proceedings of the International Conference on Low Temperature Physics (8th), Butterworths, Washington, p157-8 1963. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Superconductivity, Impurities), Potential theory, Green's function

A microscopic theory of a very small superconducting region embedded in a non-superconducting material is considered.

AD-620 491 Div. 25/6
MITRE CORP BEDFORD MASS
RESPONSE OF ELASTIC CYLINDERS TO PLANE SHEAR WAVES,
by Lawrence J. Mente, and Francis W. French. 01964, 17p. Contract AF19 628 2390
ESD , TDR-64-90

Unclassified report

Pub. in Journal of the Engineering Mechanics Division, Proceedings of the American Society of Civil Engineers v90 nEM5 p103-18 Oct 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Shear stresses, Elasticity), (*Elasticity, Cylindrical bodies), Numerical analysis

The dynamic stresses and displacements in and around a thick-walled cylinder embedded in an infinite elastic medium are determined during the passage of plane harmonic shear waves. The analysis is based on the assumption of elastic behavior, generalized plane strain, and perfect bond between cylinder and medium. Solutions are obtained consistent with the six boundary conditions at the interface and free surface. Results are presented for dimensionless stresses and displacements as a function of incident wave frequency, material property, and cylinder's geometry parameters. The angular positions of the maximum stresses with respect to the direction of wave propagation are noted. Comparisons are made to static stresses and to stresses produced by a similar compressional wave. (Author)

AD-620 492 Div. 25/6
POULTER RESEARCH LABS STANFORD RESEARCH INST MENLO PARK CALIF
IMPACT BUCKLING OF A THIN BAR,
by H. E. Lindberg. 01965, 9p. Contract AF29 601 4329

Unclassified report

Pub. in Journal of Applied Mechanics Jun 1965 (Copies not available to DDC or Clearinghouse customers). Presented at the Summer Conference o the Applied Mechanics Div., Boulder, Colo., 9-11 Jun 64 of the American Society of Mechanical Engineers.

Descriptors: (*Buckling (Mechanics), Rods), (*Rods, Buckling (Mechanics)), Impact shock, Shock waves, Probability, Rubber, Aluminum

Experiments are presented which demonstrate the statistical nature of the buckling of thin strips under very high axial compression. Probability distributions of wavelengths determined theoretically from assumed 'white-noise' perturbations in initial shape are compared favorably with the experimental distributions. In other experiments, a new optical-lever method of recording lateral motions is used to observe bending waves and buckling in an impacted strip. From these and experiments on large-strain buckling of rubber strips it is concluded that effects of axial-wave propagation do not significantly influence the wavelengths at which the buckles form. (Author)

AD-620 525 Div. 25/6
CFSTI Prices: HC $1.00 MF $0.50
ILLINOIS UNIV URBANA
STUDY OF THE ELECTRONIC PROPERTIES OF SOLIDS.
Final rept. for 1 Oct 64-31 Aug 65,
by Frederick Seitz. 31 Aug 65, 3p. Contract Nonr183412 Proj. NR017 413

Unclassified report

Descriptors: (*Transition elements, Ferromagnetic), (*Solid state physics, Transition elements), Magnetic properties, Theory

An investigation was made of the model for the microscopic origin of ferromagnetism in the transition metals. It is suggested that by regarding the d-electrons as wave packets distributed throughout the metal and interacting only with a small number of other wave packets (those with very similar energy) a theory intermediate between the itinerant electron and strong correlation theories is obtained. It has not yet been possible to provide a first principle derivation of such a model. The difficulties are essentially the same as those of providing a theory of the electron gas at intermediate densities; there being no useful expansion parameter for a perturbation treatment. Nevertheless the usefulness of the model makes such a derivation well worth pursuing.

AD-620 530 Div. 25/6 ,25/8 ,17/2
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF APPLIED CHEMISTRY
THE THERMODYNAMIC PROPERTIES AND PHASE DIAGRAM OF THE GOLD-CADMIUM SYSTEM BY THE ISOPIESTIC METHOD,
by L. J. Bartha, and W. A. Alexander. 2 Sep 64, 10p. Rept. no. NRC-8535

Unclassified report

Pub. in Canadian Journal of Chemistry, v43 p2319-27 1965. (Copies available only to DDC users).

Descriptors: (*Gold alloys, Phase studies), (*Cadmium alloys, Phase studies), Thermodynamics, Entropy, Heat of solution, Vapor pressure, Canada

Activities of cadmium in gold alloys with up to 50 atom % Cd were determined by an isopiestic method. The partial molar free energy, entropy, and heat of solution in the alpha and beta phases are calculated between 500 and 600C. The phase boundaries were observed between 16 and 60 atom % above 400C. The boundaries of the two-phase regions and beta + delta' were found at somewhat different concentrations than before, but the two-phase region alpha + alpha 2 was not observed. (Author)

AD-620 598 Div. 25/6
CFSTI Prices: HC $2.00 MF $0.50
CARNEGIE INST OF TECH PITTSBURGH PA DEPT OF MATHEMATICS
NATURAL VIBRATIONS OF CANTILEVERED TRIANGULAR PLATES I.
Technical rept.,
by R. J. Duffin, P. N. Gustafson, and W. H. Warner. 10 Sep 52, 45p. Rept. no. CIT-AF8-TR22
Contract AF33 616 1

Unclassified report

Descriptors: (*Vibration, Metal plates), (*Metal plates, Vibration), Numerical analysis, Flat plate models, Structural parts, Elasticity, Flutter

In this report the Rayleigh and Rayleigh-Ritz methods are applied to the natural vibrations of uniform triangular plates clamped on one edge and free on the other two. Two shapes of plate are investigated: an isosceles plate clamped on the base and a right triangular plate clamped on one leg. Upper bounds are obtained for the fundamental modes and in some cases for the second and third modes as well. The following classes of functions are used to represent the displacement of the plate: (1) One-parameter polynomials with integral exponents; (2) Two-parameter polynomials with integral exponents; (3) Threeparameter polynomials with integral exponents; (4) Fiveparameter polynomials with integral exponents; and (5) Monomials and binomials with variable exponents. In the absence of an exact solution of the problem the frequencies obtained are compared with experimentally determined frequencies for plates of similar shape. For this purpose a formula is developed which relates the frequencies of plates of similar planform but differing in size, thickness, and materials. The comparison between the analytical and experimental results is summarized in a table. While several of the simpler functions yield a satisfactory approximation to the fundamental frequency, only the five-parameter function (of the functions thus far examined) gives reasonable accuracy in the second and third modes, and at the same time it offers a good approximation to the fundamental. (Author)

AD-620 623 Div. 25/6 ,25/2 ,25/7
AIR FORCE CAMBRIDGE RESEARCH LABS BEDFORD MASS
INFRARED LATTICE VIBRATIONS OF MAGNESIUM STANNIDE.
Physical sciences research papers,
by A. Kahan, H. G. Lipson, and E. V. Loewenstein. 01965, 15p. Rept. no. AFCRL-65-320, PSRP-102
Proj. 5621 Task 562104

Unclassified report

Pub. in Proceedings of the International Conference on the Physics of Semiconductors (7th), Paris, 1964. (Copies available only to DDC users).

Descriptors: (*Crystal lattices, Vibration), (*Infrared spectroscopy, Semiconductors), (*Tin compounds, Magnesium compounds), Reflection, Refractive index, Dielectric properties

The room-temperature infrared reflection spectrum of semiconducting Mg2Sn with carrier concentration of 3 X 10 to the 17th power 1/cc has been measured between the wavelengths of 5 and 100 microns. By classical oscillator theory, the reflectivity of the fundamental lattice vibration region has been analyzed, and the following obtained: frequencies, strengths, and linewidths of the infrared active modes; high and low frequency dielectric constant values; and the refractive index n and extinction coefficient k as a function of wavelength. In order to fit the experimental results, it is necessary to assume two sets of dispersion parameters with the strong transverse optical (TO) resonance at 53.75 microns (186 1/cm) and a weak one at 48.25 microns (207 1/cm). (Author)

AD-620 652 Div. 25/6
CFSTI Prices: HC $2.00 MF $0.50
DAVID TAYLOR MODEL BASIN WASHINGTON D C
EXPLORATORY TESTS OF CYLINDERS WITH VARIOUS LIGHTWEIGHT STIFFENING SYSTEMS UNDER EXTERNAL HYDROSTATIC PRESSURE,
by John J. Healey. 0 Aug 65, 26p. Rept. no. 2073
Proj. SR014 03 02 Task 1956

Unclassified report

Descriptors: (*Stiffened cylinders, Buckling (Mechanics)), Hydrostatic pressure, Elasticity, Tensile properties, Density, Configuration, Structural shells, Sandwich construction, Metals, Model tests, Stresses

Twelve machined cylindrical models with length-todiameter ratios of approximately 5.0 were collapsed under external hydrostatic pressure to study the elastic buckling strength of metallic cylinders stiffened with low modulus, low density, relatively low strength materials. Three different configurations were studied; two-layered shells, continuous-core sandwich shells, and ringstiffened shells. The test results demonstrated that the use of low modulus materials in various stiffening systems can lead to significant increases in the elastic buckling strength of metallic cylindrical shells. (Author)

AD-620 669 Div. 25/6
CFSTI Prices: HC $2.00 MF $0.50
DAVID TAYLOR MODEL BASIN WASHINGTON D C
PARAMETRIC STUDY OF UNSTIFFENED AND STIFFENED PROLATE SPHEROIDAL SHELLS UNDER EXTERNAL HYDROSTATIC PRESSURE.
Final rept.,
by John J. Healey. 0 Aug 65, 43p. Rept. no. 2018
Proj. SF013 01 03 Task 0214

Unclassified report

Descriptors: (*Epoxy plastics, Structural shells), (*Ellipsoids, Buckling (Mechanics)), (*Buckling (Mechanics), Elasticity), (*Structural shells, Buckling (Mechanics)), Hydrostatic pressure, Elastic shells, Underwater, Pressure vessels, Mathematical prediction, Rings, Reinforcing materials, Model tests, Submarine hulls

Hydrostatic tests were conducted on a series of 25 unstiffened, epoxy resin prolate spheroidal shells to study the elastic buckling behavior of this shape for geometries in the following range; length-to-diameter ratios from 1.25 to 4.00 and thickness-to-radius ratios from 0.02 to 0.10. These test results demonstrate conclusively that existing analyses for predicting the elastic buckling strength of prolate spheroids are inadequate. Empirical elastic buckling equations, accurate within 5 percent for the range of geometries considered, were determined from the test data. Based in part on these results, an approximate method was developed for predicting the elastic buckling strength of ring-stiffened prolate spheroids. Test results on two stiffened epoxy resin models showed excellent agreement with the pressures calculated by this method. Equations are also proposed for the inelastic buckling of unstiffened and ring-stiffened prolate spheroids. Results are presented to illustrate the potential of these shells for deep-depth applications. (Author)

AD-620 677 **See Fld. 22**

AD-620 680 Div. 25/6
CFSTI Prices: HC $3.00 MF $0.75
STANFORD UNIV CALIF DIV OF ENGINEERING MECHANICS
BUCKLING OF SHALLOW VISCOELASTIC ARCHES.
Technical rept.,
by D. L. Anderson. 0 Aug 65, 96p. Rept. no. TR-155 ,8
Contract Nonr22569

Unclassified report

Descriptors: (*Structures, Buckling (Mechanics)), (*Structural shells, Buckling (Mechanics)), Viscoelasticity, Loading (Mechanics), Deformation, Geometric forms, Numerical analysis, Integration

A method of solution to the buckling problem for shallow viscoelastic shells is presented. The arches are considered to be pin-ended at rigid supports, of arbitrary initial shape but of uniform cross section, and made of an aribitrary linear viscoelastic material. The lateral loading may be an arbitrary function of both position and time. Specific solutions are given for several arches to point out the influence of the material and of asymmetries in the initial arch shape on the deformation and buckling time of the system. Two types of viscoelastic material, the Maxwell Fluid and the three parameter solid, are included in the examples. The viscoelastic property of the material in the analysis is expressed in integral operator form, which is shown to lead to simple numerical time integrations in determining the arch deflection, as well as maintaining the form of the governing equations that determine stability in the same general form as the equations of an elastic arch. (Author)

AD-620 685 **See Fld. 20/6**

AD-620 689 Div. 25/6
BATTELLE MEMORIAL INST COLUMBUS OHIO
ION-PAIRING BETWEEN LITHIUM AND THE RESIDUAL ACCEPTORS IN GASB,
by R. D. Baxter, R. T. Bate, and F. J. Reid. 11 May 64, 11p. Contract AF AFOSR525 64 Proj. 9761 Task 976102
AFOSR , 65-1186

Unclassified report

Pub. in Journal of Physics and Chemical Solids v26 p41-8 1965 (Copies available only to DDC users).

Descriptors: (*Gallium alloys, Impurities), (*Antimony alloys, Impurities), (*Lithium, Hall effect), Electrical properties, Ions, Diffusion, Semiconductors

The electrical properties of p-type GaSb containing lithium were measured over the temperature range 20-400K. It was found that introduction of lithium by diffusion at temperatures below 500C results in reduced hole concentrations and increased Hall mobilities. In addition, the residual acceptor level at approximately 0.03 ev characteristic of pure material, apparently disappears and is replaced by a shallow acceptor level. This behavior is taken as evidence for the formation of ion pairs between lithium donors and doubly charged residual acceptors. Introduction of lithium by diffusion at 600C and subsequent heat treatment at lower temperature results in the formation of a large density of holes associated with a shallow level, suggesting the presence of substitutional lithium. (Author)

AD-620 707 **See Fld. 20/2**

AD-620 731 Div. 25/6
CFSTI Prices: HC $1.00 MF $0.50
STANFORD UNIV CALIF DIV OF ENGINEERING MECHANICS
PRECURSOR ATTENUATION IN ELASTICVISCOELASTIC MATERIALS.
Rept. no. 2,
by J. M. Kelly. 0 Jul 65, 18p. Rept. no. TR-157
Contract DA04 200AMC659R
Unclassified report

Descriptors: (*Metals, Shock waves), (*Shock waves, Elasticity), (*Iron, Shock waves), Plasticity, Viscosity, Strain (Mechanics), Degradation, Attenuation, Propagation, Creep, Equations, Theory, Mathematical analysis

A plane shock wave of intermediate intensity in a metal is generally preceded by an elastic wave known as the elastic precursor. A theoretical analysis of the decay of this wave with distance of travel is given, based on a constitutive equation of the elastic visco-plastic type (often referred to as rate sensitive plasticity). It is shown that the predicted decay of the elastic precursor by this theory is in good agreement with published experimental measurements of the attenuation with distance of the precursor wave in Armco iron and that these measurements provide sufficient data for the determination of the parameters which appear in the theory. Accordingly such attenuation measurements in other metals could lead to an increased understanding of the influences of strain rate sensitivity on the plastic behavior of these metals. While the elastic visco-plastic constitutive equation is generally motivated on phenomenological grounds. it is shown here that it can be related to the physical theory of creep in metals. (Author)

AD-620 733 Div. 25/6 ,25/4 ,25/2 ,20/1 ,+
CFSTI Prices: HC $1.00 MF $0.50
EMMANUEL COLL BOSTON MASS RESEARCH LANGUAGE CENTER
ACTA PHYSICA SINICA, VOL. 19, NO. 12, 1963: TABLE OF CONTENTS AND ABSTRACTS.
0 Jun 64, 6p. Rept. no. E-TC-Ch-64-22
Contract AF19 628 3869
TT , 65-63812
Unclassified report

Abstract trans. of Wu Li Hsueh Pao (Chinese People's Republic) v19 n12 p771-832 1963.

Descriptors: (*Physics, Abstracting), China, Semiconductors, Nuclear properties, Ion sources, Crystal lattice defects, Paramagnetic resonance, Frequency modulation, Brittleness, Alloys, Spectra (Infrared)

Abstracts are given for: The g sub R factor of nuclei; Determination of the optimum dimensions of a pulling device of a high frequency ion source; Hopping process and impurity conduction in valence semiconductors; Strength and deformation peculiarities of binary metal whiskers; An electronic paramagnetic resonance spectrograph with frequency and magnetic field modulation; A study of the brittleness of an iron-aluminum-molybdenumsilicon alloy; The infrared spectra of the heat treated product of polyacrylonitrile-silver nitrate complex.

AD-620 738 Div. 25/6
CFSTI Prices: HC $2.00 MF $0.50
POLYTECHNIC INST OF BROOKLYN N Y DEPT OF AEROSPACE ENGINEERING AND APPLIED MECHANICS
AN ITERATIVE SOLUTION FOR ROTATIONALLY SYMMETRIC NONLINEAR MEMBRANE PROBLEMS.
Scientific rept.,
by Martin A. Goldberg. 0 Jul 65, 48p. Rept. no. PIBAL-906
Contract AF49 638 1360 Proj. 9782 Task 978201
AFOSR , 65-1504
Unclassified report

Descriptors: (*Membranes, Deflection), (*Iterative methods, Deflection), (*Deflection, Membranes), Boundary value problems, Differential geometry, Nonlinear differential equations

An improved iterative technique for the large deflection analysis of rotationally symmetric membranes is presented. This procedure takes advantage of the complementary aspects of two previously suggested relaxed iteration procedures. The resulting method utilizes the Keller-Reiss type functional for each iterate. In analogy to a technique previously suggested by the author, the relaxation parameter is then evaluated from an auxiliary equation. The iterative procedure is employed to obtain an approximate solution for an internally pressurized shallow spherical membrane, which is held at the boundary. Numerical results obtained herein are in agreement with previous solutions to this problem. (Author)

AD-620 747 Div. 25/6
CFSTI Prices: HC $2.00 MF $0.50
DAVID TAYLOR MODEL BASIN WASHINGTON D C
TESTS OF MACHINED MULTILAYER SPHERICAL SHELLS WITH CLAMPED BOUNDARIES UNDER EXTERNAL HYDROSTATIC PRESSURE,
by Kanehiro Nishida. 0 Aug 65, 45p. Rept. no. 2012
Proj. S R011 01 01 Task 0401
Unclassified report

Descriptors: (*Structural shells, Tensile properties), (*Spheres, Buckling (Mechanics)), Model tests, Pressure vessels, Sandwich construction, Submarine hulls, Hydrostatic pressure, Oceanographic equipment, Elasticity, Construction, Feasiblity studies, Bonding, Machining

Six spherical shell models with clamped boundaries onsisting of two and four layers were tested under external hydrostatic pressure to explore the feasibility of multilayer construction for application to hydrospace vehicles. In addition, four monolithic models were tested to provide a basis of comparison. Three of the multilayer shells were bonded with epoxy resin and the remaining three were not bonded. The bonded multilayer shell models collapsed at pressures approximately equal to that of the monolithic shells. The unbonded shells showed appreciable reduction in strength. (Author)

AD-620 775 Div. 25/6
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
ON THE EQUILIBRIUM AND TENSION OF A FLEXIBLE THREAD UNDER THE EFFECT OF OUTER FORCES, DEPENDING UPON THE DIRECTION OF THE THREAD IN SPACE,
by N. I. Alekseev. 20 Aug 65, 8p. Rept. no. FTD-TT-65-676
TT , 65-63832
Unclassified report

Unedited rough draft trans. of Prikladnaya Matematika i Mekhanika (USSR) v28 n5 p949-51 1964.

Descriptors: (*Fibers, Force (Mechanics)), Stresses, Mathematical analysis, USSR, Filaments, Elasticity

AD-620 796 **See Fld. 20/3**

20/13. THERMODYNAMICS

AD-620 196 **See Fld. 20/4**

AD-620 457 **See Fld. 14/2**

AD-620 487 Div. 25/8
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF AERONAUTICS AND ASTRONAUTICS
METHOD FOR DETERMINING ACCOMMODATION COEFFICIENTS FROM DATA IN THE TEMPERATUREJUMP RANGE WITHOUT APPLYING TEMPERATUREJUMP THEORY,
by Harold Y. Wachman. 12 Oct 64, 2p. Contract AF AFOSR131 64
AFOSR , 65-1157
Unclassified report

Pub. in Journal of Chemical Physics v42 n5 p1850-1 Mar 1 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Heat transfer coefficients, Gases), Kinetic theory, Temperature, Fourier analysis, Thermal conductivity

AD-620 502 **See Fld. 9/3**

AD-620 530 **See Fld. 20/12**

AD-620 534 Div. 25/8
CATHOLIC UNIV OF AMERICA WASHINGTON D C DEPT OF PHYSICS
STATISTICAL MECHANICS OF QUENCHED SOLID SOLUTIONS WITH APPLICATION TO MAGNETICALLY DILUTE ALLOYS,
by Tohru Morita. 28 May 64, 8p. Contract AF AFOSR445 63 Proj. 9767 Task 976701
AFOSR , 65-1117
Unclassified report

Pub. in Journal of Mathematical Physics v5 n10 p1401-5 Oct 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Solid solutions, Statistical mechanics), (*Statistical mechanics, Solid solutions), Alloys, Thermodynamics, Thermal properties, Magnetic properties, Quenching (Cooling)

For the motion of atoms in solid solutions or alloys prepared at high temperatures and cooled nonadiabatically, theories of phenomena related to internal degrees of freedom must account for the nonequilibrium distribution of atoms. However, such a system can be treated with the aid of a fictitious equilibrium system. The system is constructed such that its thermal equilibrium properties are the same as the properties of the non-thermalequilibrium system. Thus one can treat nonequilibrium systems by applying well known thermal equilibrium techniques to the fictitious system. The method is illustrated via the example of a magnetically dilute alloy. Brout's result for a very dilute Ising system is obtained with the aid of the theory of classical

fluids, without collecting diagrams. A method for applying the higher approximations developed for classical fluids to the present problem is suggested. (Author)

AD-620 671 See Fld. 14/2

AD-620 717 Div. 25/8 ,4/4
SUSSEX UNIV BRIGHTON (ENGLAND) PHYSICS LAB
SORPTION OF HE3 BETWEEN 0.6 K AND 4.2 K,
by D. F. Brewer, A. J. Symonds, and A. L. Thomson. 11 Nov 64, 4p. Contract AF EOAR13 64

AFOSR , 65-1339

Unclassified report

Pub. in Physics Letters v13 n4 p298-300 Dec 15 1964 (Copies available only to DDC users).

Descriptors: (*Sorption, Helium), (*Helium, Cryogenics), Surface properties, Fluids, Adsorption, Glass

Measurements on He4 in the adsorbed phase, or confined within highly porous material, show that surface effects appreciably modify the properties of the liquid. As a first step in determining their influence on liquid He3, the adsorption isotherms of He3 were measured on 'Vycor' porous glass between 0.625 K and 4.2 K, using a standard volumetric technique.

AD-620 732 See Fld. 20/8

AD-620 797 See Fld. 11/2

20/14. WAVE PROPAGATION

AD-620 091 Div. 8/5
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
FULL-WAVE MAGNETIC PULSE-WIDTH MODULATOR,
by V. L. Bunakov, and R. G. Gasparov. 3 Jun 65, 6p. Rept. no. FTD-TT-65-180
TT , 65-63327

Unclassified report

Unedited rough draft trans. of Russian patent 159197, pub 14 May 62, appl. 778385/26-9. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Pulse modulation, Magnetic modulators), Transistors, Coils, Power supplies, Direct current, Voltage regulators, Patents, USSR

Object of the invention: A full-wave magnetic pulsewidth modulator with a power supply of direct current consisting of two saturation chokes with windings connected to a source of control voltage, which is distinguished by the fact that for the purpose of simplifying the device, improving the dependability of its operation, and extending the range of width of the pulse on the input signal, on the input of the device there is connected a key, for example a semiconductor triode (transistor) controlled on the basis of pulses with a duty factor of 0.5, the output of which through ballast resistance is connected to the negative pole of a source of direct current, and at the same time to the general point of sequence-connected saturation chokes connected up to a source of direct current through stabilitrons with a voltage of stabilization of U sub (stab) (U sub (line)/2).

AD-620 100 See Fld. 20/6

AD-620 358 Div. 8/6 ,19/3
CFSTI Prices: HC $3.00 MF $0.50
SYSTEMS RESEARCH AND DEVELOPMENT SERVICE FEDERAL AVIATION AGENCY WASHINGTON D C
RADIO-INTERFERENCE PROBABILITY AND ITS EFFECT ON SITE-SEPARATION STANDARDS AND FREQUENCY ASSIGNMENT OF VHF AND UHF CHANNELS.
Technical rept.,
by Alfred J. Hoehn. 0 Aug 65, 51p. Rept. no. SRDS-RD-65-91

Unclassified report

Descriptors: (*Radio interference, Probability), (*Air traffic control systems, Radio interference), Standards, Very high frequency, Ultrahigh frequency, Wave transmission

In this report equations are developed which permit computation of the probability that radio interference will occur in ATC communications. It is shown that the probability of simultaneous occurrence of desired and undesired transmissions (utilization probability) is a dominant factor affecting the presence or absence of interference. Utilization probability, in turn, is a function of the duration of ground-based and airborne emissions. Transmitter site separation is now the primary consideration for interference control although utilization and other factors are considered informally. Site separation is shown to provide little air-to-air protection under the derogated standards which must exist in congested areas. The fact that communications have not been seriously affected under these conditions is attributed to the existence of a low utilization probability, for which rough estimates are given. Site separation computations are based on worst-case situations which have a very low probability of occurrence. These separations must be violated in practice. Insufficient statistical information is available concerning the present status or projected failure point of the system.

AD-620 396 See Fld. 4/2

AD-620 459 See Fld. 4/2

AD-620 460 See Fld. 9/5

AD-620 673 Div. 8/5 ,5/3 ,1/3
CFSTI Prices: HC $5.00 MF $1.00
CBS LABS STAMFORD CONN
STUDY OF EFFECTS AND DEGREES OF ERROR OF MODULATION-DEMODULATION.
Final technical rept., for Mar-Sep 64,
by Edward J. Foster. 0 Jun 65, 176p. Rept. no. CLD-1709
Contract AF33 657 12481 Proj. 1390 Task 139001
FDL , TR-65-6

Unclassified report

Descriptors: (*Modulation, Errors), (*Demodulation, Errors), (*Recording systems, Modulation), Magnetic tape, Aircraft equipment, Failure (Mechanics), Pulse modulation, Frequency modulation, Digital computers, Signal-to-noise ratio, Limiters, Relaxation oscillators, Modulators, Discriminators, Analog-to-digital converters, Digital-to-analog converters

A theoretical study of three modulation-demodulation methods for use in the VGH recorder was conducted. Emphasis was placed upon the suitability of each system for providing increased accuracy over low speed direct tape recording. The methods investigated were: (1) frequency modulation, (2) pulse duration modulation and (3) digital coding. The study included a general spectrum analysis, the signal-to-noise improvement available, and aliasing effects. Characteristics of each method investigated: in the frequency modulation system -- the effect of an imperfect limiter and the use of a multivibrator modulator and pulse averaging discriminator; in the pulse duration modulation system -- the comparator method of generating the signal; in the digital system -- analogto-digital and digital-to-analog conversion was analyzed with regard to sampling effects and conversion inaccuracies. A seven-pole Butterworth low pass filter of the active type was designed and constructed to eliminate the aliasing problem. Laboratory performance proved suitability of the unit for use as an input filter. (Author)

AD-620 683 Div. 8/6
CFSTI Prices: HC $3.00 MF $0.75
RAYTHEON CO NORWOOD MASS
TRANSAURORAL HIGH FREQUENCY RADIO PROPAGATION. VOLUME I. SIGNAL AMPLITUDE OBSERVATIONS.
Final rept., vol. 1, 1 Feb 62-31 Dec 64,
by Frank R. Roberts. 0 Apr 65, 69p. Contract AF19 628 339 Proj. 4603 Task 460303
AFCRL , 65-297 V1

Unclassified report

Descriptors: (*Ionospheric propagation, Radio signals), (*Radio signals, Ionospheric propagation), Atmospherics, Aurorae, Artic regions, High frequency, Radio transmission, Radiofrequency pulses, Radiofrequency interference, Radio transmitters, Greenland, Radio receivers, Massachusetts, Radio waves, Propagation, Electromagnetic waves, Geophysics

Pulsed signals of 11 and 17 mc were transmitted over the transauroral path from Thule, Greenland to Norwood, Massachusetts. This path, which is perpendicular to the auororal zone, has its midpoint near Fort Chimo, Canada in the region of maximum auroral activity. At the Norwood receiving terminal, continuous recording of signal amplitude was performed over a 17-month period. Graphical presentations of circuit performance illustrate diurnal and seasonal variations, together with the dependence on geomagetic activity. Normal propagation is F-layer controlled, although it departs markedly from classical predictions. Results of a theoretical investigation indicate that ionspheric layer tilts play no significant role in these departures. The occasional occurrence of anomalous modes is evident in the data. Absorption events coincident with reported shortwave fadeouts are noted. (Author)

AD-620 696 Div. 8/6
CFSTI Prices: HC $3.00 MF $0.75
RAYTHEON CO NORWOOD MASS
TRANSAURORAL HIGH FREQUENCY RADIO PROPAGATION. VOLUME II. SIGNAL MODE ANALYSIS.
Final rept. for 1 Feb 62-31 Dec 64,
by Frank R. Roberts. 0 Apr 65, 63p. Contract AF19 628 339 Proj. 4603 Task 460303
AFCRL , 65-297 V2

Unclassified report

See also AD-620 683.

Descriptors: (*Ionospheric propagation, Radio signals), (*Radio signals, Ionospheric propagation), Atmospherics, Aurorae, Arctic regions, High frequency, Radio transmission, Radiofrequency pulses, Multipath transmission, Ionosphere, Electromagnetic wave reflections, Radiofrequency spectroscopy, Spectrum analyzers, Radio equipment, Greenland, Massachusetts

High-frequency ionospheric propagation conditions over the 3820-km transauroral Thule-Norwood path were investigated to identify propagation anomalies and reveal their origins in terms of the geophysical environment. Three investigative techniques were employed: (1) step-frequency oblique-incidence sounding; (2) spectrum analysis of 17.7mc signals originating from a frequency-stable transmitter; (3) and film-recording the multipath structure of 17.7-mc pulsed signals transmitted from a continuously rotating directional antenna. The third technique, in addition to providing relative time delays of multipath components, also furnishes the bearing of the signal transmitted from Thule. Propagation at the frequency of primary interest (17.7mc) is predominately via the classical one- and two-hop Flayer modes, although, during the summer months, multihop E sub s modes are observed, particularly at night. The limited availa-

ble signal-spectrum data suggest that the classical one-hop F-layer signal is often characterized, on magnetically quiet days, by a spread of doppler frequencies of the order of 9.4 cps, or greater, a value substantially greater than the 1/2 to 1 cps observed on temperate latitude paths under similar magnetic conditions. An F-layer ionospheric scatter process is the suggested explanation. (Author)

AD-620 727 See Fld. 9/3

21/5. JET AND GAS TURBINE ENGINES

AD-620 245 Div. 27/2
CFSTI Prices: HC $6.00 MF $1.50
LYCOMING DIV AVCO CORP STRATFORD CONN
HEAT REGENERATIVE SYSTEM FOR T53 SHAFT TURBINE ENGINES.
Final rept., phase 1, Jul 62-Jun 63, phase 2, Feb-Oct 64.
0 Jul 65, 240p. Rept. no. 2012.3
Contract DA44 177TC824 Task 1M121401D14409
USAAVLABS, TR-65-37

Unclassified report

Descriptors: (*Turboprop engines, Gas turbine regenerators), (*Gas turbine regenerators, Turboprop engines), Feasibility studies, Design, Shafts, Fuels, Effectiveness

A heat regenerator was designed to demonstrate the feasibility of regeneration for the T53 shaft turbine engine. Parameters of the initial design, a multiwave plate type, were optimized to provide a 27-percent fuel savings at 75 percent normal rated power. Test core modules leaked beyond the 0.25-percent flow-rate limit. Consequently, effort was directed toward a conventional tube-type regenerator, which was designed to provide a 24-percent fuel savings at 75 percent normal rated power. The tube-type regenerator and the interface hardware were fabricated and integrated with the engine, and the system is ready for testing. (Author)

AD-620 294 See Fld. 11/8

AD-620 772 Div. 27/2
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
STUDYING THE NONSTATIONARY MODE OF OPERATION OF A COOLED GAS TURBINE DISK ROTOR.
by P. I. Korzh, L. V. Povolotskii, A. G. Knabe, and B. A. Arkadev. 13 Aug 65, 14p. Rept. no. FTD-TT-65-677
TT, 65-63829

Unclassified report

Unedited rough draft trans. of Energomashinostroenie (USSR) v10 n5 p6-9 1964. Available only for reference use at DDC field services. Copy is not available for public sale.

Descriptors: (*Gas turbine rotors, Operation), Temperature, Cooling, Starting, Air, Air cooled, Turbine blades, USSR

Described are results of experimentally investigating the temperature field of a disk rotor at unstationary working conditions of a gas turbine under natural conditions and an approximated analysis of the stresses state of the disk and heat exchange when cooling by radial air blasting. Determined was the possibility of rapid starting of turbine from cold state. (Author)

21/6. NUCLEAR PROPULSION

AD-620 147 Div. 21/9 ,21/8
CFSTI Prices: HC $2.00 MF $0.50
DOUGLAS AIRCRAFT CO INC SANTA MONICA CALIF MISSILE AND SPACE SYSTEMS DIV
NEUTRONIC COUPLING OF CLUSTERED NUCLEAR ENGINES,
by J. S. Woyski, and R. W. Langley. 01965, 26p. Rept. no. 3109

Unclassified report

Prepared for presentation at the Winter Meeting of the American Nuclear Society at San Francisco, California, 1 Dec 1964.

Descriptors: (*Nuclear propulsion, Engine clusters), (*Neutron transport theory, Nuclear propulsion), (*Reactor shielding calculations, Nuclear propulsion), Neutron reactions, Neutron flux, Albedo, Reactor reactivity

Nuclear propulsion engines operating in a cluster arrangement are subject to an exchange of neutron radiation. A method is presented of analysis suitable for parametric studies to determine the degree of neutronic coupling and how it affects engine performance and control stability. Results are presented for several representative nuclear engine designs in various cluster arrangements. The calculated reactivity coupling, using the albedo concept to represent the interchange of neutrons, is compared to experimental data for two KIWI B reactors. (Author)

AD-620 151 Div. 21/5
CFSTI Prices: HC $2.00 MF $0.50
DOUGLAS AIRCRAFT CO INC SANTA MONICA CALIF MISSILE AND SPACE SYSTEMS DIV
NUCLEAR ENGINE CLUSTERING CONSIDERATIONS,
by R. W. Langley, and J. S. Woyski. 01965, 37p. Rept. no. 3326

Unclassified report

Presented to the AIAA Propulsion Joint Specialists Conference, 14-18 Jun 65, Colorado Springs, Colo.

Descriptors: (*Nuclear propulsion, Space propulsion), (*Engine clusters, Nuclear propulsion), (*Space propulsion, Nuclear propulsion), Astronautics, Space probes, Spacecraft, Propulsion, Feasibility studies, Nuclear engineering

Some considerations involved in the clustering of solid-core nuclear engines are examined parametrically in order to determine their importance and to indicate the effect of system tradeoffs on vehicle performance. These include neutronic coupling effects, structural requirements, shielding, and reliability. A potentially important consideration is the propulsion system reliability. To satisfy typical propulsion reliability requirements for a manned mission, it is shown that clustering with engine-out capability is very effective in relaxing the reliability constraints of the individual engines. For example, for a Mars landing mission, engine-out capability on the first three stages results in an initial weight-out-of-orbit penalty of only 15%, but reduces the individual engine reliability requirement from 0.992 to 0.96. This can represent a sifnificant difference in engine development effort. (Author)

AD-620 650 See Fld. 10

21/7. RECIPROCATING ENGINES

AD-620 807 Div. 27/4 ,9/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
CALCULATION OF THE DISTRIBUTION OF STEAM PARAMETERS IN A TURBINE STAGE WITH AN ALLOWANCE FOR RADIAL ACCELERATION,
by M. E. Levina, P. A. Romanenko, and Yu. V. Grechanichenko. 10 Aug 65, 17p. Rept. no. FTD-TT-65-1029
TT, 65-63850

Unclassified report

Unedited rough draft trans. of Energomashinostroenie v10 n7 p41-5 1964. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Steam turbines, Gas flow), Nozzle gas flow, Axially symmetric flow, Acceleration, Partial differential equations, USSR

A method for calculating the distribution of flow parameters in a turbine stage with cylindrical flow outlines is presented and the results of calculating several stage variants are compared with experimental data. (Author)

21/8. ROCKET MOTORS AND ENGINES

AD-620 139 Div. 27/3 ,30/5
CFSTI Prices: HC $1.00 MF $0.50
ARMY MATERIALS RESEARCH AGENCY WATERTOWN MASS
GRAPHITE NOZZLE TESTING IN A SOLID PROPELLANT VARIABLE PARAMETER ROCKET ENGINE.
Technical rept.,
by Anthony K. Wong, and Albert P. Levitt. 0 Jun 65, 21p. Rept. no. AMRA-TR-65-12
Proj. DA-1A022401A110

Unclassified report

Descriptors: (*Rocket motor nozzles, Graphite), Rocket motors (Solid propellant), Tests, Erosion, Test equipment, Nozzle inserts

Although many candidate nozzle materials have been test fired in rocket static test engines, the majority of these tests have never been correlated because of lack of an established basis for comparison. In view of the complex nature of erosion, no acceptable substitute has been found for firing tests in solid propellant engines. A static test engine capable of simply, systematically, and economically firing nozzles has been developed for the purpose of providing extensive data on nozzle erosion over a wide range of operating conditions. This data will provide the basis for a better understanding of nozzle erosion mechanisms. Initial tests with this engine indicate the feasibility of testing small graphite rocket nozzles at discrete pressure intervals up to 1600 psig and burning times up to 65 seconds. (Author)

AD-620 692 See Fld. 21/9

AD-620 757 Div. 27/3
CFSTI Prices: HC $6.00 MF $1.25
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
STRENGTH OF THERMALLY STRESSED UNITS OF LIQUID ROCKET ENGINES,
by V. I. Feodosev. 10 Aug 65, 259p. Rept. no. FTD-MT-64-143
TT, 65-63814

Unclassified report

Edited machine trans. of mono. Prochnost Teplonapryazhennykh Uzlov Zhidkostnykh Raketnykh Dvigatelei, Moscow, 1963 p1-212. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Thermal stresses, Rocket motors (Liquid propellant)), (*Rocket motors (Liquid propellant), Thermal stresses), Structural shells, Strength, Deflection, Plasticity, Vibration, USSR

AD-620 791 Div. 27/3
CFSTI Prices: HC $1.00 MF $.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

FAST ACTING VALVE FOR FEEDING LIQUID, E. G., FUEL COMPONENTS IN LIQUID ROCKET ENGINES,
by Yu. V. Belyaev, A. D. Denisova, Yu. S. Tyurin, and A. S. Ryzhkin. 24 Aug 65, 6p. Rept. no. FTD-TT-65-473
TT , 65-63843

Unclassified report

Unedited rough draft trans. of Russian Patent 164 512, pub. 10 Nov 63, appl. no. 864737/24-6.

Descriptors: (*Valves, Liquid rocket fuels), Membranes, Diaphragms (Mechanics), Patents, USSR

A fast acting valve for feeding liquid, for example fuel components in liquid rocket engines, having a body, membrane, overlapping passing section and membrane piercing organ with pyro drive is described. The pyro drive is not connected in power scheme with the body and is separated from the flow through section by a flexible diaphragm, controlling the piercing organ and isolating the body from high pressure gases. (Author)

21/9.2 SOLID ROCKET PROPELLANTS

AD-620 212 See Fld. 10/3

AD-620 692 Div. 10/6 ,27/3
CFSTI Prices: HC $2.00 MF $0.50
CATHOLIC UNIV OF AMERICA WASHINGTON D C STRESS ANALYSIS LABS
AN EXPERIMENTAL STUDY OF STRESSES AT THE INTERFACE OF PROPELLANT GRAINS AND MOTOR CASES DUE TO THERMAL LOADING OF THE SHRINKAGE TYPE.
Progress rept. no. 3.
by A. J. Durelli, and V. J. Parks. 0 Aug 65, 28p.
Contract AF04 611 10378 Proj. CUA4 142 000 02

Unclassified report

Rept. on Photoelastic Analysis in the Neighborhood of Corners of Long Strips Bonded on one Side and Shrunk. See also AD-615 931.

Descriptors: (*Propellant grains, Thermal stresses), (*Rocket cases, Thermal stresses), (*Photoelasticity, Propellant grains), Rods, Bonding, Models (Simulations), Strain (Mechanics)

The stresses present at the interface between the long edge of a strip and a rigid bar to which the strip is bonded, were determined using photoelasticity. The loading is produced by the restrained shrinkage of the strip. The short ends of the strip have fillets of different configurations. Use is made of a newly developed technique to simulate the two-dimensional state of stress at the interface. The shape exhibiting the smallest stress concentration factor was obtained. (Author)

22. SPACE TECHNOLOGY

AD-620 168 Div. 12/6 ,12/1 ,26/7 ,13/10
CFSTI Prices: HC $3.00 MF $0.50
RAND CORP SANTA MONICA CALIF
MULTIVESSEL STORAGE OF FLUIDS FOR PROTECTION AGAINST METEOROIDS,
by Lloyd Kaechele. 0 Aug 65, 54p. Rept. no. RM-4293-PR
Contract AF49 638 700

Unclassified report

Report on Proj. RAND.

Descriptors: (*Storage tanks, Spacecraft), (*Meteors, Hazards), (*Hazards, Spacecraft), (*Spacecraft, Storage tanks), Multiple operation, Damage, Probability, Space environmental conditions, Pressure vessels, Thermal insulation

A study is made of the problem of protection against meteoroids in space storage and also of pressurized storage and thermal protection. For short space trips in sturdy vehicles, designed to withstand the rigors of boost and re-entry, the problem of meteoroid impact has been of relatively minor concern. The likelihood of damage, however, will increase for longer voyages in larger, more fragile vehicles. The possibility of providing safe, lightweight storage for fluids by using many small containers rather than a single large one is investigated. It is shown that multiple containers can be appreciably lighter in certain applications. A method for determining which storage system is best is developed, and the kinds of mission for which the multiple container may be better are indicated. (Author)

AD-620 179 Div. 12/6 ,12/3 ,30/5
CFSTI Prices: HC $2.00 MF $0.50
AIR FORCE FLIGHT DYNAMICS LAB RESEARCH AND TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
MOBILE DYNAMICS DATA ACQUISITION AND ANALYSIS FACILITY,
by Charles E. Thomas. 0 Jun 65, 32p. Rept. no. FDL-TR-64-182
Proj. 1472 Task 147201

Unclassified report

Descriptors: (*Data processing systems, Mobile), (*Ground support equipment, Data processing systems), Real time, Broadband, Frequency modulation, Magnetic recording system, Narrowband, Spectrum analyzers, Analog systems, Vibration, Acoustics, Noise, Wave analyzers, Amplifiers

The mobile data acquisition and analysis facility (van) was designed to acquire and analyze vibration and acoustic data in an efficient manner. The facility is mounted on a two-and-one-half ton Dodge D-500 truck chassis. It is completely self-sufficient in that it has a built-in 30-KW, 60-cycle power pack driven by the truck engine. The van has a capacity for simultaneously recording forty-two channels of data, using wide band FM magnetic tape recorders, over the frequency range of DC to 20 KC. A central system supplies coded timing data to all recorders so that real-time correlation of all data is assured. Signals are fed into the van by means of shielded cables stowed on power-driven reels on both sides of the truck chassis. The facility is equipped with a dual channel heterodyne analysis system for narrow band (1 to 50 cps) continuous spectrum analysis. It also has a Bruel and Kjaer system for octave and third octave analyses. Necessary auxiliary equipment, such as calibration standards, power supplies, signal conditioning equipment, direct recording systems, oscilloscopes, oscillators, and maintenance equipment is self-contained. (Author)

AD-620 672 Div. 12/6 ,12/1
CFSTI Prices: HC $2.00 MF $0.50
NAVAL WEAPONS LAB DAHLGREN VA
FIRST ORDER PERTURBATIONS IN LONGITUDE FOR CIRCULAR POLAR SATELLITE ORBITS, DUE TO TESSERAL HARMONICS.
Technical memo.,
by Frederick F. Pearson. 0 Aug 65, 33p. Rept. no. TM-K-67/65
Task RT8801001 2101 54390001

Unclassified report

Descriptors: (*Circular orbit trajectories, Perturbation theory), (*Polar orbit trajectories, Perturbation theory), Satellites (Artificial), Harmonic analysis, Differential equations

The paper develops the first order perturbations in mean longitude for circular polar satellite orbits for a general tesseral harmonic of order m and degree l. The development proceeds along the line of the Gaussian form of the variational equations. (Author)

AD-620 677 Div. 12/6 ,12/1 ,25/6
CFSTI Prices: HC $1.00 MF $0.50
AIR FORCE FLIGHT DYNAMICS LAB RESEARCH AND TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
WEIGHT MINIMIZATION OF HONEYCOMB HEAT SHIELDS.
Final rept. for Mar-Apr 65,
by Robert T. Achard. 0 Jun 65, 25p. Rept. no. FDL-TR-65-66
Proj. 1368 Task 136804

Unclassified report

Descriptors: (*Heat shields, Honeycomb cores), Weight, Sandwich panels, Buckling, Compressive properties, Stresses, Mathematical analysis, Failure (Mechanics), Panels (Structural), Aerospace craft

A procedure for the design of minimum weight honeycomb structures for use as radiative heat shields is presented. Formulations are applicable to panels critical to intracell buckling and face compressive yield. Minimum weight is shown to occur at the condition where design variables produce a critical buckling stress equal to the compressive yield stress. (Author)

AD-620 728 Div. 12/6 ,2/1 ,12/1
CFSTI Prices: HC $1.00 MF $0.50
CALIFORNIA UNIV LOS ANGELES DEPT OF ENGINEERING
A STUDY OF HIGH-PRECISION GEOCENTRIC AND INTERPLANETARY ORBITS.
Technical status rept. for 1 Jul 64-30 Jun 65,
by Samuel Herrick. 30 Jun 65, 14p. Rept. no. 65-34
Contract AF AFOSR241 64

Unclassified report

Descriptors: (*Astronautics, Trajectories), (*Celestial mechanics, Bibliographies), Space flight, Satellites (Artificial), Planets, Orbital trajectories

AD-620 806 Div. 12/6 ,12/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
THE SPACE PATHS OF THE VOSKHOD,
by T. Melkumov. 19 Aug 65, 7p. Rept. no. FTD-TT-65-659
TT , 65-63849

Unclassified report

Unedited rough draft trans. of Voennye Znaniya (USSR) v40 n12 p3 1964.

Descriptors: (*Satellites (Artificial), Orbital trajectories), (*Orbitals trajectories, Satellites (Artificial)), Space flight, Manned spacecraft, USSR

How To Use Indexes To TAB Portion Of

U. S. GOVERNMENT RESEARCH AND DEVELOPMENT REPORTS

SUBJECT INDEX

The Subject Index is arranged alphabetically by asterisked descriptors from the document announcements in the TAB. Each announcement contains one or more asterisked descriptors which identify the main subjects of the report. The asterisked descriptor may or may not have a modifying descriptor appearing directly below the asterisked descriptor. Under each descriptor entry in the Subject Index appear the following items of information: annotation, AD number, and field/group. A typical subject index entry is shown below.

*ALUMINUM
GLASS TEXTILES
INVESTIGATION OF GLASS-METAL COMPOSITE MATERIALS
AD-619 773 FLD. 11/7

PERSONAL AUTHOR INDEX

The Personal Author Index is arranged alphabetically by the last names of the authors of reports. When several report entries are given for one author, the entries are arranged numerically by AD number. Field/group and titles are also listed. Three asterisks serve as a separator between entries for reports under the same author. A typical personal author entry is shown below.

*CHASE, JOHN W.
* * *
THE LANTHANUM, EUROPIUM, AND DYSPROSIUM CONTENTS OF TWO TEKTITES
AD-619 828 FLD. 8/7
* * *
A PROCEDURE FOR GEOCHEMICAL INTERPRETATION OF TERRESTRIAL RARE-EARTH ABUNDANCE PATTERNS
AD-619 834 FLD. 8/7

CORPORATE AUTHOR-MONITORING AGENCY INDEX

The Corporate Author-Monitoring Agency Index is arranged alphabetically by corporate authors and monitoring agencies.

In the corporate author entry for each document are listed the originator of the report, the originator's report number, the title, AD number, and field/group. If the source has listed a monitoring agency in the report, the monitor acronym and monitor series number are given in parantheses directly under the title. An IDEP (Interservice Data Exchange Program) report number is presented in the same way. A typical corporate author entry is shown on the next page.

*AEROJET- GENERAL CORP AZUSA
CALIF

* * *

TR3015
STUDY OF THE REACTION
OF PENTABORANE WITH HYDRAZINE
AND SUBSTITUTED HYDRAZINES
(AFOSR 65-1058)
AD-619 513 FLD. 7/4

The three asterisks serve as a separator between entries for reports under the same corporate author.

When a report lists a monitoring agency, a corresponding entry is provided under the name of the monitoring agency, which appears in alphabetical order among the corporate author entries. In a monitoring agency entry, the report number is given above the title in place of the originator's report number. A typical monitoring agency entry is shown below.

*AIR FORCE OFFICE OF SCIENTIFIC
RESEARCH WASHINGTON D C

* * *

65-1058
STUDY OF THE REACTION
OF PENTABORANE WITH HYDRAZINE
AND SUBSTITUTED HYDRAZINES
AD-619 513 FLD. 7/4

CONTRACT INDEX

The Contract index is arranged alphanumerically by contract number. Within a contract grouping, each entry contains corporate author, series number (if any), monitor number (if any), AD number, and field/group.

When there are multiple document entries under one contract number, entries are arranged by AD number under each corporate author represented.

A contract entry may also contain a letter F, A, or S on the left-hand margin, indicating that the document is a Final, Annual, or Summary report. A typical contract entry is shown below.

*AF19 628 5167
LINCOLN LAB MASS INST OF TECH
LEXINGTON
(ESD TDR-65-315)
AD-619 580 FLD. 9/5
(ESD TDR-65-309)
AD-619 708 FLD. 3/1

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AD-620 269 FLD.5/10

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•AF33 608 1088
NEW HAMPSHIRE UNIV DURHAM
AD-620 448 FLD.9/1

•AF33 608 1092
NORTH CAROLINA STATE UNIV
RALEIGH
AD-620 447 FLD.12/1

•AF33 608 1095
OHIO STATE UNIV COLUMBUS
AD-620 346 FLD.3/1
AD-620 400 FLD.8/2
AD-620 401 FLD.6/5
AD-620 402 FLD.6/5
AD-620 416 FLD.9/1
AD-620 417 FLD.9/1
AD-620 418 FLD.8/2
AD-620 434 FLD.18/4

OHIO STATE UNIV COLUMBUS
DEPT OF PREVENTIVE MEDICINE
AD-620 939 FLD.6/16
OHIO STATE UNIV COLUMBUS
AD-620 932 FLD.17/2.1

•AF33 608 1096
OKLAHOMA UNIV NORMAN
AD-620 386 FLD.9/5
AD-620 387 FLD.14/2
AD-620 388 FLD.9/2
AD-620 389 FLD.9/3
AD-620 940 FLD.13/7
AD-620 941 FLD.9/1

•AF33 608 1109
PITTSBURGH UNIV PA
AD-620 920 FLD.9/2
AD-620 921 FLD.13/3
AD-620 927 FLD.13/13
AD-620 928 FLD.11/7

•AF33 608 1119
STANFORD UNIV CALIF
AD-620 945 FLD.9/9

•AF33 608 1119
SAINT LOUIS UNIV MO
AD-620 939 FLD.9/2

•AF33 608 1118
TENNESSEE UNIV KNOXVILLE
AD-620 397 FLD.1/5
AD-620 399 FLD.1/5
AD-620 905 FLD.13/6
AD-620 906 FLD.1/5
AD-620 933 FLD.1/5

•AF33 608 1119
TEXAS TECHNOLOGICAL COLL
LUBBOCK
AD-620 397 FLD.9/1
AD-620 398 FLD.9/1
TEXAS TECHNOLOGICAL COLL
LUBBOCK SCHOOL OF ENGINEERING
AD-620 943 FLD.9/10

•AF33 608 1120
TEXAS A-AND M UNIV COLLEGE
STATION
AD-620 395 FLD.18/9
TEXAS A AND M UNIV COLLEGE
STATION DEPT OF OCEANOGRAPHY
AND METEOROLOGY
AD-620 394 FLD.9/2
TEXAS A AND M UNIV COLLEGE
STATION
AD-620 938 FLD.6/13

•AF33 608 1121
TEXAS UNIV AUSTIN
AD-620 390 FLD.13/13
AD-620 391 FLD.11/7
AD-620 392 FLD.12/1
AD-620 931 FLD.13/13

•AF33 608 1133
WISCONSIN UNIV MADISON
AD-620 396 FLD.9/2

•AF33 615 1920
GENERAL DYNAMICS/POMONA CALIF
(FDL TR-69-82)
AD-620 196 FLD.20/9

•AF33 615 1899
TECHNOLOGY INC DAYTON OHIO
APPLIED SCIENCES DIV
(AMRL TR-69-27)
F AD-620 319 FLD.6/16

•AF33 616 1
CARNEGIE INST OF TECH PITTSBURGH
PA DEPT OF MATHEMATICS
AD-620 998 FLD.20/12

•AF33 616 3398
MASSACHUSETTS INST OF TECH
CAMBRIDGE DYNAMIC ANALYSIS
AND CONTROL LAB
AD-620 997 FLD.9/5

•AF33 616 6909
AEROSPACE RESEARCH LABS OFFICE
OF AEROSPACE RESEARCH WRIGHT-
PATTERSON AFB OHIO
AD-620 797 FLD.11/2

•AF33 657 10939
MASSACHUSETTS INST OF TECH
CAMBRIDGE LAB FOR INSULATION
RESEARCH
AD-620 289 FLD.20/8

•AF33 657 11115
SPACE AND INFORMATION SYSTEMS
DIV NORTH AMERICAN AVIATION
INC DOWNEY CALIF
SID 69 2074 2
F AD-620 699 FLD.20/9

•AF33 657 11224
AMERICAN CYANAMID CO STAMFORD
CONN
(ML TR-69-231)
F AD-620 734 FLD.11/9

•AF33 657 12481
CBS LABS STAMFORD CONN
(FDL TR-69-6)
F AD-620 673 FLD.20/14

•AF33 657 7399
CLEVITE CORP CLEVELAND OHIO
ELECTRONIC RESEARCH DIV
(ARL 69-98)
F AD-620 297 FLD.20/12

•AF33 657 7469
RITCHIE AND ASSOCIATES INC
DAYTON OHIO
(RTD TDR-63-4000)
F AD-620 177 FLD.17/7

•AF49 638 1028
STANFORD RESEARCH INST MENLO
PARK CALIF
(AFOSR 69-0781)
AD-620 376 FLD.9/9

•AF49 638 1041
NORTHWESTERN UNIV EVANSTON
ILL DEPT OF MATERIALS SCIENCE
(AFOSR 69-1484)
F AD-620 337 FLD.20/12

•AF49 638 1168
WESTINGHOUSE ELECTRIC CORP
PITTSBURGH PA DEPT OF
SOLID STATE PHENOMENA
(AFOSR 69-1485)
F AD-620 270 FLD.20/12

•AF49 638 1282
TUFTS UNIV MEDFORD MASS
INST FOR PSYCHOLOGICAL RESEARCH
(AFOSR 69-1309)
AD-620 726 FLD.5/10

•AF49 638 1319
COMPUTER USAGE CO INC PALO
ALTO CALIF
(AFOSR 69-1612)
F AD-620 186 FLD.9/2

•AF49 638 1333
PALMER PHYSICAL LAB PRINCETON
UNIV N J
(AFOSR 69-1063)
AD-620 639 FLD.20/8
(AFOSR 69-1064)
AD-620 640 FLD.20/8

•AF49 638 1347
AEROJET-GENERAL NUCLEONICS
SAN RAMON CALIF
(AFOSR 69-1044)
F AD-620 223 FLD.20/3

•AF49 638 1360
POLYTECHNIC INST OF BROOKLYN
N Y DEPT OF AEROSPACE ENGINEERING
AND APPLIED MECHANICS
(AFOSR 69-1504)
AD-620 738 FLD.20/12

•AF49 638 1418
GENERAL ELECTRIC CO ITHACA
N Y ELECTRONICS LAB
(AFOSR 69-1284)
AD-620 224 FLD.6/13

•AF49 638 1454
COMPUTER USAGE CO INC PALO
ALTO CALIF
(AFOSR 69-1612)
F AD-620 186 FLD.9/2

•AF49 638 21
PALOMAR OBSERVATORY PASADENA
CALIF
(AFOSR 69-1079)
AD-620 993 FLD.3/1

•AF49 638 496
JOHNS HOPKINS UNIV BALTIMORE
MD DEPT OF MECHANICS
(AFOSR 69-0642)
AD-620 329 FLD.20/4
(AFOSR 69-1201)
AD-620 324 FLD.20/3

•AF49 638 589
LYMAN LAB OF PHYSICS HARVARD
UNIV CAMBRIDGE MASS
(AFOSR 69-1346)
AD-620 364 FLD.20/3

•AF49 638 700
RAND CORP SANTA MONICA CALIF
AD-620 148 FLD.22
AD-620 227 FLD.9/1
AD-620 228 FLD.9/1
AD-620 292 FLD.19/5
AD-620 458 FLD.20/10
AD-620 650 FLD.10
AD-620 667 FLD.12/1
AD-620 748 FLD.6/16

•AF49 638 947 GRANT
RIAS INC BALTIMORE MD
(AFOSR 69-1283)
AD-620 499 FLD.6/1

•AF61 052 259
HAMBURGER STERNWARTE (GERMANY)
(AFCRL 69-169)
F AD-620 117 FLD.3/1

•AF61 052 909
UNIVERSITY COLL GALWAY (EIRE)
(AFOSR 69-1282)
AD-620 716 FLD.6/1

•AF61 052 976
TECHNION -ISRAEL INST OF TECH
HAIFA DEPT OF AERONAUTICAL
ENGINEERING
A AD-620 199 FLD.20/9

•AF61 052 990
SYSTEM RESEARCH LTD RICHMOND
(ENGLAND)
(AFOSR 69-1168)
AD-620 996 FLD.9/2

•AF61 052 699
HEBREW UNIV JERUSALEM (ISRAEL)
(AFCRL 69-629)
F AD-620 906 FLD.20/6

•AF61 052 689
LIEGE UNIV COINTE-SCLESSIN
(BELGIUM) INSTITUT D'ASTROPH
YSIQUE
(AFCRL 69-967)
AD-620 909 FLD.3/1

•AF61 052 798
MANCHESTER COLL OF SCIENCE
AND TECHNOLOGY (ENGLAND)
DEPT OF PHYSICS
(AFCRL 69-696)
AD-620 907 FLD.3/1

•AT40 1 3293 GRANT

MIAMI UNIV CORAL GABLES FLA
DEPT OF PHYSICS
AD-620 949 FLD.20/3

•AT99 8 2110
NAVAL RESEARCH LAB WASHINGTON D C
AD-620 136 FLD.11/6

•AT99 7 2939
NAVAL RESEARCH LAB WASHINGTON D C
AD-620 354 FLD.18/8

•DA ARO D31 1246218
PENNSYLVANIA UNIV PHILADELPHIA
(AROD 3333:10)
AD-620 639 FLD.12/1
(AROD 3333:20)
AD-620 636 FLD.12/1

•DA MD49 193 63690
WASHINGTON SCHOOL OF PSYCHIATRY D C
AD-620 723 FLD.6/16

•DA MD49 193 646109
NATIONAL TAIWAN UNIV TAIPEI (CHINA) COLL OF MEDICINE
AD-620 629 FLD.6/15

•DA ORD12
YALE UNIV NEW HAVEN CONN
DEPT OF MATHEMATICS
(AROD 3333:18)
AD-620 634 FLD.12/1

•DAD1 021AMC11691Z
BATTELLE MEMORIAL INST COLUMBUS OHIO
(NASA TM-X-533121)
AD-620 908 FLD.13/8
(NASA TM-X-533131)
AD-620 909 FLD.13/8

•DAD4 200AMC659R
STANFORD UNIV CALIF DIV OF ENGINEERING MECHANICS
AD-620 731 FLD.20/12

•DAD4 495AMC116X
GENERAL ATOMIC DIV GENERAL DYNAMICS CORP SAN DIEGO CALIF
AD-620 193 FLD.20/4

•DA11 022ORD2059
MATHEMATICS RESEARCH CENTER UNIV OF WISCONSIN MADISON
AD-620 102 FLD.12/1
AD-620 103 FLD.20/12
AD-620 104 FLD.20/12
AD-620 105 FLD.20/4
AD-620 106 FLD.12/1
AD-620 107 FLD.12/1
AD-620 108 FLD.20/4
AD-620 109 FLD.12/1
AD-620 110 FLD.12/1

•DA11 070AMC0828
REACTION MOTORS DIV THIOKOL CHEMICAL CORP DENVILLE N J
AD-620 946 FLD.11/10

•DA11ORD022 3119
CHICAGO UNIV ILL LABORATORY OF MOLECULAR STRUCTURE AND SPECTRA
(AROD 3835:8)
AD-620 631 FLD.7/2

•DA19 020ORD4912
YALE UNIV NEW HAVEN CONN
(AROD 3333:19)
AD-620 633 FLD.12/1

•DA19 129AMC2114X
AMERICAN MEAT INST FOUNDATION CHICAGO ILL
(ANL FD-21)
AD-620 974 FLD.6/8

•DA19 129AMC59N
EVANS RESEARCH AND DEVELOPMENT CORP NEW YORK
(ANL FD-19)
F AD-620 742 FLD.6/8

•DA19 129QM1396
OREGON STATE UNIV CORVALLIS DEPT OF FOOD SCIENCE AND TECHNOLOGY
(USA-NLABS FD-16)
AD-620 675 FLD.6/8

•DA19 129QM1972
AMERICAN MEAT INST FOUNDATION CHICAGO ILL
(ANL FD-22)
F AD-620 975 FLD.6/8

•DA28 093AMC00073E
ILLINOIS UNIV URBANA COORDINATED SCIENCE LAB
AD-620 249 FLD.20/6

•DA28 093AMC00073E GRANT
ILLINOIS UNIV URBANA COORDINATED SCIENCE LAB
AD-620 248 FLD.9/2

•DA28 093AMC00099E
COLUMBIA RADIATION LAB NEW YORK
AD-620 965 FLD.7/4

•DA28 093AMC00190E
MOTOROLA INC PHOENIX ARIZ SEMICONDUCTOR PRODUCTS DIV
AD-620 800 FLD.9/1

•DA28 093AMC00342E
NORTH ELECTRIC CO GALION OHIO
AD-620 967 FLD.17/2
AD-620 686 FLD.17/2

•DA28 093AMC00466E
CITY COLL RESEARCH FOUNDATION NEW YORK
AD-620 601 FLD.9/3

•DA31 124ARO D128
HARVARD UNIV CAMBRIDGE MASS
(AROD 1617:50)
AD-620 620 FLD.12/1

•DA31 124ARO D165
YALE UNIV NEW HAVEN CONN
(AROD 4302:3)
AD-620 603 FLD.12/1

•DA31 124ARO D298
RIAS INC BALTIMORE MD
(AROD 5023:1)
AD-620 513 FLD.11/6

•DA31 124ARO D288
ILLINOIS UNIV URBANA DEPT OF MATHEMATICS
(AROD 3333:21)
AD-620 637 FLD.12/1

•DA33 017CIVENG64 7
ILLINOIS UNIV URBANA DEPT OF CERAMIC ENGINEERING
F AD-620 339 FLD.11/2

•DA36 039AMC00070E
KORAD CORP SANTA MONICA CALIF
AD-620 685 FLD.20/6

•DA36 039AMC02264E
GENERAL ELECTRIC CO SYRACUSE N Y TUBE DEPT
F AD-620 947 FLD.9/1

•DA36 039AMC02292E
GENERAL ANILINE AND FILM CORP BINGHAMTON N Y PHOTO AND REPRO DIV
F AD-620 187 FLD.19/8

•DA36 039AMC03200E
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
AD-620 713 FLD.14/2
AD-620 714 FLD.20/8

•DA36 039AMC03200E GRANT
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
AD-620 641 FLD.9/3

•DA36 039AMC03624E
LINDE DIV UNION CARBIDE CORP CLEVELAND OHIO
F AD-620 999 FLD.9/1

•DA36 039SC87362
UNIDYNAMICS/PHOENIX ARIZ
F AD-620 212 FLD.10/3

•DA99 009AMC179X
BURNS AND ROE INC NEW YORK
F AD-620 116 FLD.9/3
F AD-620 137 FLD.14/2

•DA99 009AMC930T
HOLMAN (JOHN F) CO INC WASHINGTON D C
(AERDL T-1797-65)
AD-620 222 FLD.19/1
(AERDL T-1800-65)
AD-620 961 FLD.14/3

•DA99 177AMC191T
KAMAN AIRCRAFT CORP BLOOMFIELD CONN
(USAAVLABS TR-65-23)
F AD-620 247 FLD.1/3

•DA99 177AMC892T
MISSISSIPPI STATE UNIV STATE COLLEGE DEPT OF AEROPHYSICS
(USAAVLABS TR-65-41)
AD-620 246 FLD.20/4

•DA99 177TC824
LYCOMING DIV AVCO CORP STRATFORD CONN
(USAAVLABS TR-65-27)
F AD-620 249 FLD.21/5

•DA99 007MD938
MICHIGAN UNIV ANN ARBOR SCHOOL OF DENTISTRY
AD-620 649 FLD.6/12

•DA99 186AMC98X
FLORIDA UNIV GAINESVILLE ENGINEERING AND INDUSTRIAL EXPERIMENT STATION
F AD-620 209 FLD.10

•DA99 193MD2238
MARYLAND UNIV COLLEGE PARK DEPT OF ZOOLOGY
AD-620 701 FLD.6/3

•DA99 193MD2391
BRITISH COLUMBIA RESEARCH COUNCIL VANCOUVER
AD-620 919 FLD.6/3
AD-620 628 FLD.6/3

•DA99 193MD2610
TECHNOLOGY INC DAYTON OHIO
AD-620 912 FLD.6/16

•DA99 193MD2627
DELAWARE UNIV NEWARK
AD-620 618 FLD.6/15

•DA9I 991EUC3998
TRINITY COLL DUBLIN (IRELAND) PHYSICAL LAB
AD-620 948 FLD.9/3

•DRB9501 08
ROYAL MILITARY COLL OF CANADA KINGSTON (ONTARIO) DEPT OF PHYSICS
AD-620 937 FLD.20/3

•FA AC4 730
CIVIL AEROMEDICAL RESEARCH INST OKLAHOMA CITY OKLA
(AM- 69-21)
AD-620 721 FLD.5/9

•NASA NGR05 002 028
CALIFORNIA INST OF TECH PASADENA
AD-620 615 FLD.3/1
AD-620 616 FLD.3/1

•NAS7 100
JET PROPULSION LAB CALIF INST OF TECH PASADENA
AD-620 161 FLD.11/6

•NIH GM11399
TULANE UNIV NEW ORLEANS LA
DEPT OF CHEMISTRY
(AROD 4375-5)
AD-620 621 FLD.7/3

•NIH NB04352
MICHIGAN UNIV ANN ARBOR
DEPT OF PHYSIOLOGY
(AFOSR 69-1166)
AD-620 527 FLD.6/16

•NIH PH43 63 36
RIAS INC BALTIMORE MD
(AFOSR 69-1283)
AD-620 999 FLD.6/1

•NOBSR87522
ROTRON MFG CO WOODSTOCK N Y
AD-620 269 FLD.13/9

•NOBSR89201
LEAR SIEGLER INC GRAND RAPIDS MICH INSTRUMENT DIV
AD-620 111 FLD.14/2

•NOBSR89482
HUGHES AIRCRAFT CO OCEANSIDE CALIF VACUUM TUBE PRODUCTS DIV
F AD-620 379 FLD.9/1

•NOBSR89489
HP ASSOCIATES PALO ALTO CALIF
AD-620 267 FLD.9/1

•NOBSR91206
DUMONT ELECTRON TUBES CLIFTON N J
AD-620 729 FLD.9/1
AD-620 730 FLD.9/1

•NOBSR91229
TRACOR INC AUSTIN TEX
AD-620 199 FLD.17/1

•NOBS72444
IIT RESEARCH INST CHICAGO ILL
AD-620 700 FLD.9/1

•NOBS88242
CORNELL AERONAUTICAL LAB INC BUFFALO N Y
F AD-620 524 FLD.20/4

•NOBS90487
GENERAL ATOMIC DIV GENERAL DYNAMICS CORP SAN DIEGO CALIF
AD-620 511 FLD.10

•NOBS92090
GENERAL DYNAMICS CORP GROTON CONN ELECTRIC BOAT DIV
F AD-620 144 FLD.1/4

•NOBS92311
OLIN MATHIESON CHEMICAL CORP NEW HAVEN CONN CHEMICALS DIV
AD-620 164 FLD.11/8

•NONR115102
CENTRAL INST FOR THE DEAF ST LOUIS MO
(NAVMED NM-13-01-99-1-6)
AD-620 257 FLD.5/10

•NONR120214
WISCONSIN UNIV MADISON DEPT OF ZOOLOGY
AD-620 514 FLD.6/3

•NONR122434
MICHIGAN UNIV ANN ARBOR
AD-620 702 FLD.5/10

•NONR122434 GRANT
MICHIGAN UNIV ANN ARBOR RESEARCH CENTER FOR GROUP DYNAMICS
AD-620 681 FLD.5/10

•NONR122818
NORTHWESTERN UNIV EVANSTON ILL
AD-620 269 FLD.5/10
F AD-620 266 FLD.5/10

•NONR122832
NORTHWESTERN UNIV EVANSTON ILL DEPT OF MATERIALS SCIENCE
AD-620 118 FLD.20/12

•NONR128604
OREGON STATE UNIV CORVALLIS DEPT OF CHEMISTRY
AD-620 327 FLD.7/2
AD-620 328 FLD.7/3

•NONR143904
WESTERN RESERVE UNIV CLEVELAND OHIO ULTRASONICS RESEARCH LAB
AD-620 697 FLD.20/1

•NONR183412
ILLINOIS UNIV URBANA
F AD-620 525 FLD.20/12

•NONR185809
PRINCETON UNIV N J
AD-620 163 FLD.7/4

•NONR185827
FRICK CHEMICAL LAB PRINCETON UNIV N J
AD-620 424 FLD.7/4

•NONR219600
WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS
AD-620 182 FLD.8/10
AD-620 518 FLD.8/10

•NONR22047
CALIFORNIA INST OF TECH PASADENA
AD-620 517 FLD.20/8
AD-620 615 FLD.3/1
AD-620 616 FLD.3/1

•NONR221601
SCRIPPS INSTITUTION OF OCEANOGRAPHY UNIV OF CALIFORNIA LA JOLLA
AD-620 609 FLD.8/10

•NONR221623
SCRIPPS INSTITUTION OF OCEANOGRAPHY UNIV OF CALIFORNIA LA JOLLA
AD-620 607 FLD.8/10
AD-620 609 FLD.8/10
AD-620 712 FLD.8/10

•NONR221623 GRANT
SCRIPPS INSTITUTION OF OCEANOGRAPHY UNIV OF CALIFORNIA LA JOLLA
AD-620 608 FLD.8/10

•NONR22299 GRANT
CALIFORNIA UNIV SAN FRANCISCO MEDICAL CENTER
AD-620 515 FLD.6/16
AD-620 516 FLD.6/16

•NONR22277
CALIFORNIA UNIV BERKELEY CENTER FOR RESEARCH IN MANAGEMENT SCIENCE
AD-620 676 FLD.5/3

•NONR22289 GRANT
SPACE SCIENCES LAB UNIV OF CALIFORNIA BERKELEY
AD-620 969 FLD.8/14

•NONR22290
CALIFORNIA UNIV BERKELEY
AD-620 715 FLD.5/10

•NONR22552
STANFORD UNIV CALIF DEPT OF STATISTICS
AD-620 278 FLD.12/1
AD-620 288 FLD.12/1
AD-620 290 FLD.12/1
AD-620 291 FLD.12/1

•NONR22569
STANFORD UNIV CALIF DIV OF ENGINEERING MECHANICS
AD-620 680 FLD.20/12

•NONR229602
SYRACUSE UNIV N Y
AD-620 160 FLD.5/10

•NONR242401
SINAI HOSPITAL OF BALTIMORE MD BIOCHEMISTRY RESEARCH DIV
AD-620 729 FLD.18/4

•NONR254100
LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF RESEARCH LABS
AD-620 699 FLD.20/8

•NONR26336
DAVIDSON LAB STEVENS INST OF TECH HOBOKEN N J
AD-620 802 FLD.12/1

•NONR26645
COLUMBIA RADIATION LAB NEW YORK
AD-620 369 FLD.7/4

•NONR26693
COLUMBIA UNIV NEW YORK PLASMA LAB
AD-620 936 FLD.20/6

•NONR279401
NEW YORK MEDICAL COLL N Y
AD-620 709 FLD.6/5

•NONR299300
STANFORD RESEARCH INST MENLO PARK CALIF
AD-620 213 FLD.6/15

•NONR332000
LITTON SYSTEMS INC WALTHAM MASS
AD-620 706 FLD.5/4

•NONR335100
WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS
AD-620 182 FLD.8/10

•NONR363402
KANSAS STATE UNIV MANHATTAN
AD-620 739 FLD.20/6

•NONR37918
TEXAS UNIV AUSTIN DEPT OF PSYCHOLOGY
AD-620 462 FLD.5/10
AD-620 463 FLD.5/10
AD-620 522 FLD.5/10
AD-620 523 FLD.5/10

•NONR387705
DARTMOUTH COLL HANOVER N H
F AD-620 333 FLD.5/10

AD-620 617 FLD.5/10
AD-620 703 FLD.5/10

•NONR90127
CENTER FOR RADIOPHYSICS AND SPACE RESEARCH CORNELL UNIV ITHACA N Y
AD-620 290 FLD.3/1

•NONR998800
NATIONAL MARINE CONSULTANTS DIV INTERSTATE ELECTRONICS CORP ANAHEIM CALIF
F AD-620 968 FLD.20/4

•NONR97715
WASHINGTON UNIV SEATTLE DEPT OF MATHEMATICS
AD-620 162 FLD.12/1

•NONR977400
HONEYWELL INC ST PAUL MINN
AD-620 336 FLD.6/16

•NONR99915
TUFTS UNIV MEDFORD MASS
AD-620 183 FLD.5/10

•NONR97100
YALE UNIV NEW HAVEN CONN DEPT OF BIOLOGY
F AD-620 756 FLD.6/3

•NONR58600
KRESGE EYE INST DETROIT MICH
(NAVMED MR005.13-6004-2-17)
AD-620 325 FLD.1/2
(NAVMED NM-17-01-99-2-16)
AD-620 326 FLD.6/16

•NONR60923
YALE UNIV NEW HAVEN CONN DEPT OF BIOLOGY
F AD-620 796 FLD.6/3

•NONR65630
PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF PSYCHOLOGY
AD-620 192 FLD.5/10
AD-620 189 FLD.5/10
AD-620 190 FLD.5/10
AD-620 191 FLD.5/10
AD-620 923 FLD.5/10

•NONR65633
PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF AERONAUTICAL ENGINEERING
AD-620 193 FLD.20/4

•NONR66815
ROCHESTER UNIV N Y
AD-620 929 FLD.7/4

•NONR76029
CARNEGIE INST OF TECH PITTSBURGH PA GRADUATE SCHOOL OF INDUSTRIAL ADMINISTRATION
AD-620 172 FLD.5/1
AD-620 173 FLD.5/1
AD-620 174 FLD.12/1
AD-620 175 FLD.5/1
AD-620 176 FLD.12/1

•NONR83927
POLYTECHNIC INST OF BROOKLYN N Y
AD-620 965 FLD.20/12

•NONR98207
OKLAHOMA UNIV RESEARCH INST NORMAN
AD-620 707 FLD.20/2

•NONR99100
GEORGIA INST OF TECH ATLANTA ENGINEERING EXPERIMENT STATION
AD-620 937 FLD.20/2

•NONR99106
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OTHER RESEARCH REPORTS AND RELATED MATERIAL

REPORTS RELEASED BY AEC, NASA, DEPARTMENT OF COMMERCE, OTHER CIVILIAN AGENCIES, AND ALSO CERTAIN OLDER MILITARY REPORTS.

*Descriptors marked with an asterisk are included in the subject index

01. Aeronautics

Patent 3,196,557 Field 1B, 14B

CENTRIFUGE MOUNTED MOTION SIMULATOR.
Patent assigned to NASA,
by Jess S. W. Davidsen and Estin H. Baker.
27 Jul 65

Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Aeronautics, Flight simulators), (*Flight simulators, Centrifuges), (*Centrifuges, Flight simulators) Motion, Cockpits, Positioning devices(Machinery), Drives, Patents.

The apparatus simulates inflight motion of an aircraft or space craft. The centrifuge mounted motion simulator has a centrifuge arm supported at one end by a trolley running on a circular track. The track provides a reaction surface for a centrifuge arm drive cable driven from a power source located at the point of pivotal connection of the other end of the centrifuge arm.

SC-RR-64-1689 Field 1A
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
STATIC PRESSURES ON CONE-CYLINDERS IN SLIP TO TRANSITION FLOWS,
by K. J. Touryan. Jan 65, 23p
Contract AT(29-1)-789

Unclassified report

Descriptors: (*Conical bodies, Aerodynamic loading), (*Cylindrical bodies, Aerodynamic loading).

UCRL-13144 Field 1A
CFSTI Prices: HC$2.00 MF$0.50

Colorado Univ., Boulder. Engineering Research Center.
REFINEMENT OF THE P-V-T-T PRIMARY METHOD FOR MEASURING THE MASS FLOW RATES OF GASES.
Final rept.,
by B. T. Arnberg. 31 Dec 64, 49p

Unclassified report

Descriptors: (*Gas flow, Measurement).

02. Agriculture

TID-21588 Field 2F
CFSTI Prices: HC$4.00 MF$1.00

Duke Univ., Durham, N. C. School of Forestry.
ROOT EXTENSION IN A PLANTATION OF LONGLEAF PINE: INVESTIGATION OF A TECHNIQUE USING I-131,
by Frank W. Woods. 1963, 129p
Contract AT(40-1)-2790

Unclassified report

Descriptors: (*Trees, Tracer studies), (*Iodine, Radioisotopes).

03. Astronomy and Astrophysics

UCRL-12191 Field 3B
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
MECHANISM OF TYPE II SUPERNOVA EXPLOSIONS,
by Stirling A. Colgate and Richard H. White. 16 Dec 64, 20p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Supernovae, Explosions), (*Thermonuclear reactions, Supernovae).

04. Atmospheric Sciences

AD-446 295 Field 4B, 22B
CFSTI Price: HC$3.00

Satellite and Mesometeorology Research Project, Univ. of Chicago, Ill.
TABLES OF SCAN NADIR AND HORIZONTAL ANGLES,
by William D. Bonner. Jul 64, 53p
Research paper SMRP-RP-31
Grant CWB WBG6
N64 33793

Unclassified report

Descriptors: (*Scanning, Tables), (*Meteorological satellites, Scanning), Radiometers, Data, Satellites(Artificial).

Tables are presented which may be used in place of the tilt and radiometer grids in the Fujita technique for the analysis of satellite radiation data. Scan geometry is briefly described and an example is given showing the use of the tables in plotting a scan line on an OEC projection. (Author)

SC-RR-64-1756 Field 4A
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
SOUND RAYS IN THE ATMOSPHERE,
by R. J. Thompson. Jan 65, 12p N65-19801
Contract AT(29-1)-789
Unclassified report

Descriptors: (*Sound transmission, Atmosphere), (*Atmosphere, Sound transmission).

SC-TM-8-62(51) Field 4B, 9B
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
WIND MEASUREMENT FOR DIGITAL RECORDING,
by J. W. Reed. 9p CONF-789-3
Contract AT(29-1)-789
Unclassified report

Presented at Americal Meteorological Society National Conference on Micrometeorology, Salt Lake City, 13-16 Oct 64.

Descriptors: (*Wind, Vector analysis), (*Digital recording systems, Wind).

TID-21471 Field 4A
CFSTI Prices: HC$4.00 MF$1.00

Massachusetts Inst. of Tech., Cambridge. Dept. of Meteorology.
ENERGY GENERATION THROUGH RADIATIVE PROCESSES IN THE LOWER STRATOSPHERE,
Rept. no. 11,
by James S. Kennedy. 1 Dec 64, 123p
Contract AT(30-1)-2241
Unclassified report

Descriptors: (*Stratosphere, Energy), (*Solar radiation, Stratosphere), Infrared radiation, Ozone.

UCRL-7633 Field 4A, 3B, 20H
CFSTI Prices: HC$2.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
NEAR EARTH, HIGH LATITUDE SATELLITE MEASUREMENTS OF COSMIC RAY FLUX IN 1961,
by F. D. Seward and H. N. Kornblum, Jr. 31 Dec 63, 28p
Contract W-7405-eng-48
Unclassified report

Descriptors: (*Cosmic rays, Radiation measurement systems).

05. Behavioral and Social Sciences

AD-404 105 Field 5B, 9B
CFSTI Price: HC$2.00

System Development Corp., Santa Monica, Calif.
RESEARCH IN TECHNIQUES FOR IMPROVING AUTOMATIC ABSTRACTING PROCEDURES,
by R. E. Wyllys. 19 Apr 63, 31p
Technical memo. no. TR-1087/000/01 Unclassified report

Descriptors: (*Abstracting, Automatic), Vocabulary, Measurement, Reports, Classification, Language, Computers, Data processing.

The central problem in automatic abstracting is the measurement of the representativeness of words and sentences with respect to the essential content of the document. A number of such measures, varying in sophistication from frequency of word occurrence to the utilization of various textual and linguistic procedures, will be tested and evaluated. Four sets of experiments ar are planned: (1) Development of Representativeness Criteria, (2) Production and Evaluation of Automatic Abstracts, (3) Document Categorization, and (4) Automatic Abstracting in Russian. (Author)

PB-168 181 Field 5B, 9B
CFSTI Prices: HC$2.00 MF$0.50

Auerbach Corp., Philadelphia, Pa.
STANDARD IS AND R REPORTS, VOLUME IV. SURVEY OF IS AND R COMPUTER PROGRAMS,
Technical rept.
27 Mar 64, 49p Rept. no. 1144-TR-1, vol. 4
Contract NSF C335 Unclassified report

See also PB-168 178, PB-168 179, and PB-168 180.

Descriptors: (*Information retrieval, Standards), (*Programming(Computers), Information retrieval), Analysis, Data, Subject indexing, Search theory.

A preliminary survey of Information Storage and Retrieval (IS and R) programs for general-purpose computers is made as an initial step toward the analysis of such programs by means of a standardized data gathering format. The three types of IS and R programs are identified and defined: permuted title index programs, search programs, and dissemination programs. A single framework for analyzing all three types of programs is described, along with a classification system for the several types of search programs. The main characteristics of typical IS and R programs currently available are given, not only for the three types of IS and R programs, but also for the different classifications of search programs. (Author)

PB-168 199 Field 5B, 9B
CFSTI Prices: HC$1.00 MF$0.50

Moore School of Electrical Engineering, Univ. of Pennsylvania, Philadelphia.
AUTOMATIC STRATIFICATION OF INFORMATION,
by D. Lefkovitz and N. S. Prywes. 1963, 12p
Contract Nonr55140 Unclassified report
Proceedings of the Spring Joint Computer Conference v23 p229-40 1963.

Descriptors: (*Information retrieval, Vocabulary), (*Subject indexing, Classification), Programming-(Computers).

The stratification scheme consists of separation of a descriptor vocabulary, used to describe the items in a library, based upon two principles; namely, whether individual descriptors do or do not occur together in descriptions of items. This paper is directed specifically to the mechanization of stratification based on the latter of these principles. The problem treated is: Given an arbitary information file, how to arrange the descriptors of the data to constitute large groups of descriptors which are exclusive in that the descriptors in a group do not co-occur in the description of any item. For this purpose the input data are semiautomatically processed to form 'exclusive' attribute groups.

PB-168 206 Field 5C
CFSTI Prices: HC$5.00 MF$1.00

RAND Corp., Santa Monica, Calif.
A TENTATIVE INPUT-OUTPUT TABLE FOR THE USSR 1941 PLAN,
by N. Kaplan, J. Blackman, H. Heymann, D. Redding, and N. Rodin. 2 Sep 52, 155p Memo. no. RM-924
ATO 210 756

Unclassified report

Rept. on proj. RAND.

Descriptors: (*Economics, USSR), (*Industrial production, USSR), Tables.

The report represents the results of a 10 week, 5-10 man effort to produce a general purpose Soviet input-output table for the Soviet Union. The table is by no means, and was not intended to be, a finished product. The objective was to explore briefly what could be done and to have the results suggest what, if anything, should be done in the way of further research. We have decided to present and circulate the results in an effort to solicit advice on this kind of research. No other use of the present results is suggested or intended.

PB-168 245 Field 5G
CFSTI Prices: HC$3.00 MF$0.75

Indiana Univ., Bloomington. Linguistics Research Proj.
NOUNS BEFORE THAT-CLAUSES IN ENGLISH,
by F. W. Householder, Jr., Loraine T. Bridgeman, P. David Seaman, Robert Cheng, and Dale Dillinger.
Jun 65, 54p
Grant NSF GS108

Unclassified report

Descriptors: (*Language, Classification), (*Classification, Language), Catalogs, Vocabulary.

Original test frames were set up with the idea of paralleling research done by D. Alexander and P. H. Matthews (Adjectives before 'that'-clauses in English, Linguistics Research Proj. of the Indiana Univ., Sept. 1964, PB-166 560). Lists are given for the nouns preceding the clauses. The final test frames illustrate a syntactic subclassification of the nouns: Subdivisions of frames 1 and 2 were necessary according to the 'grammatic function' of the noun phrase to be substituted. In frames A through D the noun phrase precedes the verb and functions as subject of transitive or intransitive verb; in E the noun phrase follows the transitive verb and functions as object; in F the noun phrase follows the copulative verb preceded by impersonal 'it'; in G the noun phrase precedes a copulative verb.

PB-168 254 Field 5B, 9B
CFSTI Prices: HC$2.00 MF$0.50

Linguistics Research Center, Univ. of Texas, Austin.
LRC LIST PROCESSING SYSTEM MANUAL,
by David Senechalle, Jun 65, 29p
Rept. no. LRC-65-TTM-1
Grant NSF GN308

Unclassified report

Descriptors: (*Informational retrieval, Programming-(Computers)), (*Programming(Computers), Information retrieval), Instruction manuals, Data processing systems.

A list processing package developed at the Linguistics Research Center, The University of Texas, is described. The routines have been tested on an IBM 7040 computer and are designed to process paired data items in lists. All coding has been done in MAP. The routines may be called from MAP or FORTRAN IV. The package has been developed to permit efficient sorting and manipulation of alphanumeric data, and the creation of special matrix representations and matrix operations in algorithms for linguistic data processing. (Author)

PB-168 255 Field 5G, 9B, 6D
CFSTI Prices: HC$2.00 MF$0.50

Linguistics Research Center, Univ. of Texas, Austin.
MACHINE LANGUAGE TRANSLATION STUDY.
Quarterly progress rept. no. 8, 1 Feb-30 Apr 65,
by W. P. Lehmann and E. D. Pendergraft. Apr 65, 80p Rept. no. LRC-65
Grant NSF GN308
NSF 24
See also PB-167 491.

Unclassified report

Descriptors: (*Machine translation, Scientific research), (*Language, Scientific research), Programming(Computers), Analysis, Information retrieval, Classification, Automatic, Dictionaries.

Generalized programming systems are now in operational use which (a) maintain large stores of linguistic corpora or descriptive data, (b) perform automatic syntactic analysis, synthesis or translation, (c) prepare concordances or linguistic statistics, (d) perform automatic classification, (e) perform coordinate and associative information retrieval, and (f) process informant data. The analysis and classification capabilities are being combined in a self-organizing linguistic system. Descriptive studies of several languages, notably English, German, Russian, Japanese and Spanish, are in progress. Work is continuing in classification theory and algorithms, with applications in time-shared associative retrieval and automatic linguistic classification. (Author)

PB-168 261 Field 5B
CFSTI Prices: HC$1.00 MF$0.50

Bell Telephone Labs., Inc., Murray Hill, N. J.
KEEPING RESEARCH IN CONTACT WITH THE LITERATURE: CITATION INDEXES AND BEYOND,
by John W. Tukey. 1962, 6p

Unclassified report

Pub. in IRE Transactions on Engineering Writing and Speech vEWS-5 n2 p78-82 Dec 1962.

Descriptors: (*Scientific research, Indexes), (*Indexes, Scientific research), Subject indexing, Classification, Bibliographies, Reports.

The most familiar relationship between articles is provided by the references which each author makes to earlier articles. These links are used to trace the development of a subject, to pull together a bibliography of references on a special topic, or to try to find out what is known about some particular question. The main deficiency of using these links when organized into lists of references is that they trace only backward in time. The links can be reassembled so that topics can be traced forward in time. A citation index, when entered with a particular article, reveals a list of articles which have referred to the particular article. The ability to go both forward and backward in time which is provided by combined use of citation index and lists of references, and the ability of the user to assess which paths are closer to his goal, or more likely to approach it, combine to make the literature network into a very effective tool for browsing, for covering a limited area in depth, or for keeping up with one's own special interest. (Modified from report)

PB-168 264 Field 5B, 9B
CFSTI Prices: HC$4.00 MF$1.00

Information Dynamics Corp., Wakefield, Mass.
A METHODOLOGY FOR THE ANALYSIS OF INFORMATION SYSTEMS.
Final rept.,
by David E. Sparks, Mark M. Chodrow, and Gail M. Walsh.
May 65, 114p Rept. no. R-4003-1
Contract NSF C370

Unclassified report

See also AD-168 265.

Descriptors: (*Scientific research, Documentation), (*Documentation, Scientific research), Mathematical models, Programming(Computers), Processing, Costs, Information retrieval.

PB-168 265 Field 5B, 9B
CFSTI Prices: HC$8.45 MF$2.00

Information Dynamics Corp., Wakefield, Mass.
A METHODOLOGY FOR THE ANALYSIS OF INFORMATION SYSTEMS. APPENDICES.
Final rept., appendices,
by David E. Sparks, Mark M. Chodrow, Gail M. Walsh, and Lawrence L. Laine. May 65, 545p
Rept. no. R-4003-1, app.
Contract NSF C370

Unclassified report

Available copy will not permit fully legible reproduction.
See also AD-168 264.

Descriptors: (*Scientific research, Documentation), (*Documentation, Scientific research), Mathematical models, Programming(Computers), Processing, Costs, Information retrieval, Input-output devices, Time, Communication systems, Data.

Contents:
Appendix A, Mathematical modeling tools:
Information service centers and user communities, general description of process flow, mathematical representation of process flow, processing manhours and processing costs, costs associated with information materials, costs associated with communications, reduction of input data requirements
Appendix B, Computer input requirements:
Input data requirements, operating instructions
Appendix C, Test case data:
Qualitative input data, quantitative input data, bibliography, data assembly guide
Appendix D, Program output and analysis:
Description of output, derived data, comparison of data.

PB-168 271 Field 5G, 9B
CFSTI Prices: HC$1.00 MF$0.50

Research Lab. of Electronics, Mass. Inst. of Tech., Cambridge.
MECHANICAL TRANSLATION.
Quarterly progress rept. no. 65,
by H. J. Zimmermann, G. G. Harvey, W. B. Davenport, Jr., and Carol M. Bosche. 15 Apr 62, 15p
Grants NSF G24047, NSF G16843

Unclassified report

Part 16 of Quarterly progress rept. no. 65.
See also PB-168 278.

Descriptors: (*Mechanical translation, Scientific research), (*Language, Scientific research), Analysis.

Relatedness between grammital systems: Four systems of work order in English Sentences are examined in sequence. A given system and that following it in the sequence are compared to see how the differences between them, in terms of the sentences each contains, are reflected in their individual grammars. An operation common to the 4 systems-the attachment, motivated by position, or a marker (case) to a certain class of words (pronouns)-is found to manifest a progressively weaker relationship to the function.

PB-168 273 Field 5G
CFSTI Prices: HC$1.00 MF$0.50

Research Lab. of Electronics, Mass. Inst. of Tech., Cambridge.
MECHANICAL TRANSLATION.
Quarterly progress rept. no. 66,
by V. H. Yngve, Carol M. Bosche, Elinor K. Charney, J. L. Darlington, and D. A. Dinneen. 15 Jul 62, 7p
Grants NSF G16843, NSF G24047

Unclassified report

Part 17 of Quarterly progress rept. no. 66.
See also PB-168 271, PB-168 278.

Descriptors: (*Mechanical translation, Scientific Research), (*Language, Scientific research), Analysis.

The problem of paraphrasing among semantically equisignificant sentences is considered where the problem is claimed to be one of translation: the difference between what is usually regarded as translation and paraphrasing being that in translation, sentences of one language system are mapped onto sentences of another language system and that in paraphrasing, sentences of a language system are mapped onto sentences in the same language system. A theory of semantics, in order to be complete, must be able to explain the nature of each type of paraphrase and be able to state explicitly the transformation rules of sentence synonymy, i. e., those rules that map sentences from one language system onto sentences within the same language system.

PB-168 275 Field 5G, 9B, 6D
CFSTI Prices: HC$1.00 MF$0.50

Research Lab. of Electronics, Mass. Inst. of Tech., Cambridge.
MECHANICAL TRANSLATION.
Quarterly progress rept. no. 67,
by V. H. Yngve, Carol M. Bosche, Elinor K. Charney, Ann Congleton, and J. L. Darlington. 15 Oct 62, 12p
Grants NSF G24047, NSF G24073

Unclassified report

Part 13 of Quarterly progress rept. no. 67.
See also PB-168 273.

Descriptors: (*Mechanical translation, Scientific research), (*Language, Scientific research), Analysis, Automata, Programming(Computers), Vocabulary.

Contents:
Sentence parsing with a self-organizing heuristic program, by K. C. Knowlton
German word-order rules, by W. K. Percival
Arabic to English translation, by A. C. Satterthwait.

PB-168 278 Field 5G, 9B
CFSTI Prices: HC$1.00 MF$0.50

Research Lab. of Electronics, Mass. Inst. of Tech., Cambridge.

MECHANICAL TRANSLATION.
Quarterly progress rept. no. 64,
by V. H. Yngve, E. S. Klima, J. J. Viertel,
M. P. Barnett, and Carol M. Bosch. 15 Jan 62, 25p
Grants NSF G16843, NSF G13903

Unclassified report

Part 24 of Quarterly progress rept. no. 64.

Descriptors: (*Mechanical translation, Scientific research), (*Language, Scientific research), Programming(Computers), Analysis.

Research is being conducted (1) to learn how languages can be translated by machine, (2) to evaluate the fidelity that can be achieved with different approaches to mechanical translation, the usefulness of the translations for various purposes, and their costs, and (3) to add to the general knowledge of noncomputational uses of digital computers and to a basic understanding of human understanding. This report has papers on (1) an analysis of those features of natural language that function as the analog of the free variable in logical and mathematical systems, by Elinor K. Charney, and (2) interlingual correspondence at the grammatical level, by E. S. Klima.

PB-168 281 Field 5B
CFSTI Prices: HC$1.00 MF$0.50

American Inst. of Physics, New York. Documentation Research Project.
A REVIEW OF WORK COMPLETED AND IN PROGRESS, 1961-1965,
by Pauline Atherton. Apr 65, 16p
Rept. nos. AIP-DPR-65-3, Pub. R-181

Unclassified report

Descriptors: (*Documentation, Physics), (*Physics, Documentation), Periodicals, Indexes, Abstracting, Subject indexing, Bibliographies, Information retrieval, Printing, Scientific research, Classification.

The ultimate objective of the Documentation Research Project is the creation of adequate reference retrieval systems for physicists. Activities are listed in 6 categories. (1) User studies wherein record was made of selected physicists, their research endeavors, and their search requests. (2) Existing reference retrieval systems wherein all known methods for organizing physics literature are collected and studied. (3) Content analysis and indexing, such as the scheme of analysis embodying 'property', 'object', and 'method'. (4) Citation indexing. (5) New journal composition techniques. (6) Miscellaneous studies, including a current awareness journal, the place of letters to the editor in distribution of information, abbreviations of journal titles, and a pilot plant approximation to a full-scale reference retrieval system. Appendixes include (1) an excerpt from AIP/DRP 62-1 on an outline of the Project and (2) a bibliography of AIP/DRP reports.

PB-168 284 Field 5B, 9B
CFSTI Prices: HC$1.00 MF$0.50

Linguistics Research Center, Univ. of Texas, Austin.
RETRIEVAL SYSTEM EXPERIMENTATION AND EVALUATION AT LRC,
by A. G. Dale. Jul 65, 9p
Grant NSF GN308

Unclassified report

Paper prepared for NATO International Advanced Study Inst. on Evaluation of Information Retrieval Systems, Jul 65.

Descriptors: (*Information retrieval, Scientific research), Effectiveness, Subject indexing, Vocabulary, Classification, Automatic, Computers, Reports.

In place of previously used absolute parameters of retrieval performance, a somewhat weaker measure of relative efficiency is proposed that is appropriate to the particular type of retrieval system under investigation at the Linguistics Research Center, and to the particular problem of investigating the effects of controlled changes in indexing techniques within the system. It appears that desirable features also include (a) classification of types of request, and evaluation of system performance separately with reference to each type, and (b) the use of simulation techniques to permit rapid generation of experimental statistics. (Author)

PB-168 288 Field 5G
CFSTI Prices: HC$2.00 MF$0.50

Bunker-Ramo Corp., Canoga Park, Calif.
COMPUTER-AIDED RESEARCH IN MACHINE TRANSLATION, D199-STEM-AFFIXING PROCEDURES: A TEST FOR NOUNS,
by Gerhard Reitz, Loretta Ertel, Marguerite Mazur, and Steven Smith. 19 Jul 65, 49p Progress rept. PR-10
Contract NSF C372

Unclassified report

Descriptors: (*Machine translation, Vocabulary), Programming(Computers), Dictionaries.

A special routine has been written and employed to carry out an exhaustive testing of the stem-affixing routine as it applies to nouns. The stem-affixing routine was checked against all the noun forms found in Oettinger's 'Automatic Language Translation', Harvard University Press, Cambridge, 1960. The Bunker-Ramo stem-affixing routine operates on full form dictionary entries and allows, in theory, for the stem-affixing of any member of a paradigm from any other member of that paradigm. Unique dictionary entries were constructed for each member of every noun paradigm found in Oettinger. These dictionary entries consisted of Russian words with special prefixes devised in such a way that a special routine could construct an entire correct paradigm corresponding to each unique dictionary entry. Each member of the machine-constructed paradigm was then introduced as a one-word sentence. Thus, a complete test was made of the stem-affixing routine's ability to derive any member of a given paradigm from any other member of that paradigm. A complete tabulation of the results as well as flow diagrams for the stem-affixing routine and the special routine to construct the test input from the dictionary entries are included.

06. Biological and Medical Sciences

ANL-6839 Field 6R
CFSTI Prices: HC$3.00 MF$0.75

Argonne National Lab., Ill.
HEALTH DIVISION GAMMA-RAY SPECTROSCOPY GROUP.
Semiannual rept. for Jan-Jun 64.
Jan 65, 83p
Contract W-31-109-eng-38

Unclassified report

Descriptors: (*Gamma-ray spectroscopy, Health physics).

ANL-6938 Field 6R, 7E, 18B
CFSTI Prices: HC$6.00 MF$1.50

Argonne National Lab., Ill.
RADIOLOGICAL PHYSICS DIVISION.
Annual rept. for Jul 63 - Jun 64.
1964, 278p
Contract W-31-109-eng-38

Unclassified report

Descriptors: (*Radiation chemistry, Health physics), (*Health physics, Radiobiology).

ANL-6971 Field 6R
CFSTI Prices: HC$6.00 MF$1.25

Argonne National Lab., Ill.
BIOLOGICAL AND MEDICAL RESEARCH DIVISION.
Annual rept. 1964.
Dec 64, 230p
Contract W-31-109-eng-38

Unclassified report

Descriptors: (*Radiobiology, Medical research).

BNL-7790 Field 6R
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
DIAGNOSIS OF RADIATION INJURY,
by Eugene P. Cronkite. 1963, 16p
Contract AT(30-2)-GEN-16

Unclassified report

Descriptors: (*Radiation injuries, Diagnosis).

BNL-7860 Field 6C
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
ENDOGENOUS CIRCADIAN RHYTHMS AND THE RESPONSE OF LEMNA PERPUSILLA TO SKELETON PHOTOPERIODS,
by William S. Hillman. 1963, 14p
Contract AT(30-2)-GEN-16

Unclassified report

Descriptors: (*Photoperiodism, Rhythm(Biology)), (*Plants(Botany), Photoperiodism).

BNL-7890 Field 6R
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
CHANGES IN RADIOSENSITIVITY OF ROOTS IF GLYCINE MAX (L.) MERRIL, DURING POST-DORMANT REACTIVATION,
by Jerome P. Miksche. 1963, 15p
Contract AT(30-2)-GEN-16

Unclassified report

Descriptors: (*Seeds, Radiation effects), (*Radiation effects, Plants(Botany)).

BNL-7917 Field 6R
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
ON THE DISTRIBUTION OF REDUCED SILVER GRAINS IN AUTORADIOGRAMS OF BONE AND CARTILAGE FOLLOWING H 3-AMINO ACID ADMINISTRATION,
by Edgar A. Tonna. 1964, 22p
Contract AT(30-2)-GEN-16

Unclassified report

Descriptors: (*Bone, Autoradiography), (*Autoradiography, Bone).

BNL-8031 Field 6P
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
CARRIER AND OVERLOADING EFFECTS ON THE METABOLISM OF DL-TRYPTOPHAN-7A-C 14,
by L. V. Hankes and Max Schmaeler. 1964, 6p
Contract AT(30-2)-GEN-16

Unclassified report

Descriptors: (*Tryptophan, Metabolism), (*Metabolism, Tryptophan).

BNL-8420 Field 6P, 6E
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
SYNTHESIS AND RESOLUTION OF DL-DYNUREMINE KETO-14C.
by Lawrence V. Henkes. 64, 12p CONF-774-1
Contract AT(30-2)-GEN-16

Unclassified report

Presented at the international symposium on the preparation and biomedical application of labeled molecules, Venice, Aug 64.

Descriptors: (*Tryptophan, Tracer studies).

BNL-8641 Field 6P
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
COMPUTER APPLICATIONS IN METABOLIC STUDIES OF 14 CO2 EXCRETION.
Walton W. Shreeve. 25 Sep 64, 9p
CONF-754-5

Unclassified report

Presented at International Business Machines Medical Symposium, Poughkeepsie and Upton, N. Y., 5-9 Oct 1964.

Descriptors: (*Carbon dioxide, Excretion), (*Excretion, Metabolism), Computers.

BNL-8864 Field 6P
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
TRANSFERS OF 14 C AND TRITIUM FROM SUBSTRATES TO CO 2, WATER, AND LIPIDS IN OBESE AND DIABETIC SUBJECTS IN VIVO,
by Walton W. Shreeva. 1964, 24p
CONF-641213-1
Contract AT(30-2)-GEN-16

Unclassified report

Presented at the New York Academy of Sciences, New York City.

Descriptors: (*Diabetes, Tracer studies).

CONF-801-2 Field 6R
CFSTI Prices: HC$1.00 MF$0.50

Michigan State Univ., East Lansing. Dept. of Biophysics.
FACTORS AFFECTING THE RESPONSE OF PROTEINS TO VARIOUS RADIATIONS,
by Leroy Augenstein. 1964, 13p
Contract AT(11-1)-1155
Unclassified report

Presented at the Panel on the Molecular Basis of Radiosensitivity, Vienna, Austria, 16-20 Nov 64.

Descriptors: (*Radiation effects, Proteins), (*Proteins, Radiation effects).

COO-878-15 Field 6R
CFSTI Prices: HC$1.00 MF$0.50

Illinois Univ., Urbana.
RECOVERY FROM RADIATION-INDUCED DIVISION BLOCK IN PROTISTS,
Final scientific rept.,
by H. S. Ducoff. Mar 65, 17p
Contract AT(11-1)-878
Unclassified report

Descriptors: (*Radiation effects, Cells(Biology)), (*Cells(Biology), Radiation effects).

LA-3204-MS Field 6R, 18C
CFSTI Prices: HC$4.00 MF$0.75

Los Alamos Scientific Lab., Univ. of California, N. Mex.
CALCULATION OF RETINAL DOSE DUE TO VISIBLE RADIATION FROM NUCLEAR EXPLOSIONS,
by Robert D. Cowan. 6 Oct 64, 101p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Retina, Radiation effects), (*Radiation effects, Nuclear explosions).

LADC-6168 Field 6R
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
THE ABSENCE OF AVOIDANCE RECOGNITION BY THE MOUSE SUBJECTED TO CHRONIC INVARIANT GAMMA-RAY EXPOSURES,
by J. C. Hensley and J. E. Spalding. 1962, 10p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Radiological dosage, Sensory perception), (*Gamma rays, Sensory perception).

LADC-6384 Field 6A, 6C
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
SYNCHRONIZED MAMMALIAN CELLS IN SUSPENSION CULTURE,
by D. F. Petersen and E. C. Anderson. 1964, 20p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Tissue culture cells, Life cycle), (*Life cycle, Tissue culture cells), Mammals.

LA-DC-6646 Field 6R
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
RAPID ESTIMATION OF FAST NEUTRON DOSES FOLLOWING RADIATION EXPOSURE IN CRITICALITY ACCIDENTS. THE 32 S(N,P) 32 P REACTION IN BODY HAIR
by Donald F. Petersen. 1965, 21p CONF-650302-5
Contract W-7405-eng-36
Unclassified report

Presented at the IAEA Symposium on Personnel Dosimetry for Accidental high-level exposure to external and internal radiation, Vienna.

Descriptors: (*Radiological dosage, Hair), (*Hair, Radiological dosage).

NYO-901-4 Field 6R
CFSTI Prices: HC$1.00 MF$0.50

New England Deaconess Hospital, Boston, Mass. Cancer Research Inst.
CHROMOSOME ANALYSIS AS AN INDICATOR OF RADIATION EXPOSURE,
by Lorraine Meisner. 13 Apr 64, 8p
Contract AT(30-1)-901
Unclassified report

Descriptors: (*Radiation effects, Chromosomes), (*Chromosomes, Radiation effects).

ORNL-3806 Field 6C, 6L
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
TECHNIQUES FOR HEMATOLOGICAL STUDIES OF WILD MAMMALS,
by Lovell L. Lewis and Paul B. Dunaway. Jun 65, 19p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Hematology, Mammals), (*Mammals, Hematology).

ORNL-3809 Field 6R
CFSTI Prices: HC$3.00 MF$0.50

Oak Ridge National Lab., Tenn.
STOCHASTIC MODELS FOR THE DISTRIBUTION OF RADIOACTIVE MATERIAL IN A CONNECTED SYSTEM OF COMPARTMENTS,
by S. R. Bernard, V. R. Rao Uppuluri, and L. R. Shenton. Jun 65, 48p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Radiobiology, Stochastic processes), (*Stochastic processes, Radiobiology).

ORNL-P-750 Field 6R
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
NEW CHALLENGES IN CLINICAL COUNTING,
by D. A. Ross, C. C. Harris, and M. M. Satterfield. 1964, 20p
Contract W-7405-eng-26 Unclassified report

Presented at the Meeting of the Japanese Society of Nuclear Medicine, Tokyo, Japan, 18 Nov 64.

Descriptors: (*Dosimeters, Medical equipment).

ORNL-P-758 Field 6R
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
LETHAL, MUTAGENIC AND CYTOGENETIC EFFECTS OF FAST, CHARGED PARTICLES ON VARIOUS BIOLOGICAL MATERIALS,
by G. E. Stapleton. 1964, 16p CONF-720-8
Contract W-7405-eng-26
Unclassified report

Presented at the Symposium on Protection Against Radiation Hazards In Space, (No. 2) Gatlinburg, Tenn., 12-14 Oct 64.

Descriptors: (*Radiation effects, Charged particles), (*Charged particles, Tissues(Biology)).

ORNL-P-802 Field 6R
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
CALCULATED TISSUE CURRENT-TO-DOSE CONVERSION FACTORS FOR NUCLEONS OF ENERGY BELOW 400 MEV,
by W. E. Kinney and C. D. Zerby. 1964, 36p
CONF-720-22
Contract W-7405-eng-26
Unclassified report

Presented at the Symposium on Protection Against Radiation Hazards in Space, (No. 2) Gatlinburg, Tenn., 12-14 Oct 64.

Descriptors: (*Radiation hazards, Radiological dosage), (*Radiological dosage, Tissues(Biology)), Radiation effects.

ORNL-P-1111 Field 6E, 6C
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
HYBRID RESISTANCE TO PARENTAL HEMATOPOIETIC CELL GRAFTS: IMPLICATIONS FOR BONE MARROW CHIMERAS,
by Gustavo Cudkowicz. 1965, 34p CONF-717-19
Contract W-7405-eng-26
Unclassified report

Presented at The CNRS Meeting on Graft of Allogenic Hematopoietic cells, Paris, France 7-9 Sep 64.

Descriptors: (*Transplantation, Bone marrow).

ORNL-TM-997 Field 6R
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
DESIGN OF 90 SR SOURCES FOR ECOLOGICAL STUDIES INVOLVING BETA IRRADIATION,
by E. P. Menhinick. 11 Nov 64, 17p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Radiobiology, Ecology), (*Radiation effects, Tissues(Biology)).

ORNL-TM-1008 Field 6R
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
THE SYSTEMS APPROACH IN RADIATION ECOLOGY,
by Bernard G. Patten. 16 Nov 64, 17p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Radiobiology, Ecology).

ORNL-TM-1049 Field 6R
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
REDISPERSION OF SETTLED PARTICULATES,
by B. R. Fish, R. L. Walker, and G. W. Royster, Jr.
5 Feb 65, 19p CONF-555-17
Contract W-7405-eng-26
Unclassified report

Presented at the International Symposium on Surface Contamination, Gatlinburg, Tenn., Jun 64.

Descriptors: (*Radiological contamination, Scattering).

ORNL-TM-1068 Field 6J, 6R
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
MULTIPLANT RADIATION EMERGENCY DRILL, OAK RIDGE NATIONAL LABORATORY, OCTOBER 20, 1964
by G. C. Cain and J. H. Greene. Apr 65, 56p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Health physics, Industrial medicine), (*Training, Health physics).

Patent 3,197,465 Field 6F, 7C

DITHIO-BIS-AZIRIDINE AND 2-METHYL DERIVATIVE THEREOF.
Patent assigned to Agriculture,
by Charles W. Woods and Alexej B. Borkovec. 27 Jul 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Insects, Pest control), (*Diptera, Pest control), (*N-heterocyclic compounds, Synthesis-(Chemistry)), (*Organic sulfur compounds, Synthesis-(Chemistry)), Reproduction, Inhibition, Patents.

The compounds are used for the control or eradication of insect populations by causing sexual sterility in the insect. The compound may be incorporated in a food or bait. The compounds are 1,1'-dithiodiaziridine and 1,1'-dithiobis(2-methylaziridine).

PB-168 280 Field 6D, 9B
CFSTI Prices: HC$2.00 MF$0.50

Willow Run Labs., Univ. of Michigan, Ann Arbor.
A NEW METHOD OF SIMULATING THE CENTRAL NERVOUS SYSTEM USING AN AUTOMATIC DIGITAL COMPUTER,
by J. W. Crichton and J. H. Holland. 27 Mar 59,
43p Rept. no. 2144-1195-M Unclassified report

Descriptors: (*Bionics, Central nervous system), (*Central nervous system, Simulation), Mathematical models, Digital computers, Brain, Nerve cells, Nerve impulses, Data storace systems, Programming-(Computers).

An outline of methods which are to be used in simulating nerve nets structurally analogous to portions of the human brain and obeying laws of the sort hypothesized by D. O. Hebb is given. Methods are explained by which nets can be simulated which have about 150 synapses per neuron. It is indicated that with the use of an IBM Type 704 computer with 2000 words of storage available in addition to that used for program and constants, 2000 neurons can be simulated. Ways of increasing the ratio of numbers of neurons to numbers of words of storage are given. (Author)

SC-DC-64-1829 Field 6T, 6J
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
EVALUATION OF SOLVENT EXPOSURE BY BREATH ANALYSIS,
by Lial W. Brewer. Oct 64, 5p CONF-808-2
Contract AT(29-1)-789
Unclassified report

Presented at American Industrial Hygiene Assn. Rocky Mountain Section Meeting, Colorado Springs, Colo., Oct 64.

Descriptors: (*Cleaning compounds, Chemical analysis), (*Poisonous gases, Chemical analysis).

TID-20274 Field 6E
CFSTI Prices: HC$3.00 MF$0.75

New England Deaconess Hospital, Boston, Mass. Cancer Research Inst.
PHENYLKETONURIA,
by W. Eugene Knox. 24 Feb 64, 94p
Contract AT(30-1)-901
Unclassified report

Descriptors: (*Mental disorders, Diagnosis).

TID-20342 Field 6E
CFSTI Prices: HC$3.00 MF$0.50

New England Deaconess Hospital, Boston, Mass. Cancer Research Inst.
CYSTINURIA,
by W. Eugene Knox. 6 Mar 64, 56p
Contract AT(30-1)-901
Unclassified report

Descriptors: (*Urinary system, Diseases), Diagnosis.

TID-20372 Field 6A
CFSTI Prices: HC$1.00 MF$0.50

McCollum-Pratt Inst., Johns Hopkins Univ., Baltimore, Md.
ELECTROPHORESIS OF MOUSE LIVER SUBFRACTIONS,
by G. Lew Choules, and Robert Ballentine.
15 Jan 64, 26p
Contract AT(30-1)-1822
Unclassified report

Descriptors: (*Electrophoresis, Liver), (*Liver, Mice).

TID-20373 Field 6A
CFSTI Prices: HC$1.00 MF$0.50

McCollum-Pratt Inst., Johns Hopkins Univ., Baltimore, Md.
THE EFFECT OF TRIS ON MOUSE LIVER TISSUE AND SUBFRACTIONS,
by G. Lew Choules. 15 Jan 64, 13p
Contract AT(30-1)-1822
Unclassified report

Descriptors: (*Amines, Liver), (*Liver, Mice).

TID-20374 Field 6A, 6C
CFSTI Prices: HC$1.00 MF$0.50

McCollum-Pratt Inst., Johns Hopkins Univ., Baltimore, Md.
BUFFERED FIXATIVES SUITABLE FOR MOUSE LIVER MITOCHONDRIA,
by G. Lew Choules. 15 Jan 64, 13p
Contract AT(30-1)-1822
Unclassified report

Descriptors: (*Mitochondria, Liver), (*Liver, Mice), Buffers.

TID-20520 Field 6A
CFSTI Prices: HC$2.00 MF$0.50

Athens Univ., (Greece). Dept. of Clinical Therapeutics.
LIPID METABOLISM IN HUMAN LEUCOCYTES IN VITRO. I. BIOSYNTHESIS AND METABOLIC UTILIZATION OF LONG CHAIN FATTY ACIDS,
by C. J. Miras, J. D. Mantzos, and G. M. Levis.
1964, 39p
Contract AT(30-1)-2769
Unclassified report

Descriptors: (*Fatty acids, Metabolism), (*Leukocytes, Lipids).

TID-20600 Field 6R
CFSTI Prices: HC$1.00 MF$0.50

New England Deaconess Hospital, Boston, Mass. Cancer Research Inst.
RADIATION PROTECTION PROBLEMS ASSOCIATED WITH RADIOACTIVE GOLD,
by Egilda D. Witherell and Russell F. Cowing.
7 May 64, 8p
Contract AT(30-1)-901
Unclassified report

Descriptors: (*Radiotherapy, Gold), (*Gold, Radiotherapy).

TID-21374 Field 6R, 18D, 20F
CFSTI Prices: HC$3.00 MF$0.75

Rochester Univ., N. Y. Atomic Energy Project.
THE DEVELOPMENT OF A COLLIMATOR FOR THE HYBRID RADIOISOTOPE SCANNER.
Master's thesis,
by Ronald Joseph Martone. 1964, 96p
Unclassified report

Descriptors: (*Radioactive isotopes, Scanning), (*Collimators, Mercury), (*Mercury, Collimators).

TID-21545 Field 6F
CFSTI Prices: HC$4.00 MF$1.00

Duke Univ., Durham, N. C. School of Forestry.
A STUDY OF ROOT DISTRIBUTION IN TWO HARDWOOD STANDS IN THE DUKE FOREST.
Final rept.
31 Jan 65, 116p
Contract AT(40-1)-2790
Unclassified report

Descriptors: (*Forestry, Ecology), (*Ecology, Trees).

TID-21712 Field 6R
CFSTI Prices: HC$2.00 MF$0.50

Saint Margarets Hospital, Boston, Mass.
THE EFFECT OF IRRADIATION ON THE MORPHOLOGICAL AND BIOCHEMICAL CHANGES ACCOMPANYING PHAGOCYTOSIS BY LEUKOCYTIC CELLS.
Progress rept., Jun 64-Mar 65.
1965, 40p
Contract AT(30-1)-3240
Unclassified report

Descriptors: (*Reticuloendothelial system, Radiation effects).

UCLA-12-523 Field 6E
CFSTI Prices: HC$2.00 MF$0.50

California Univ., Los Angeles. Lab. of Nuclear Medicine and Radiation Biology.
EXPERIMENTAL BASIS OF QUANTITATIVE RADIORENOGRAPHY FOR EVALUATING RENAL ISCHEMIA,
by Earl K. Dore, G. V. Taplin, and D. E. Johnson.
May 64, 34p
Contract AT(04-1)-GEN-12
Unclassified report

Descriptors: (*Diagnostic agents, Kidneys), (*Kidneys, Blood circulation), Hypertension, Anemias.

UCLA-12-541 Field 6R, 6A, 6E, 6O, 6T
CFSTI Prices: HC$4.00 MF$1.00

California Univ., Los Angeles. Lab. of Nuclear Medicine and Radiation Biology.
SEMIANNUAL PROGRESS REPORT FOR THE PERIOD ENDING DECEMBER 31, 1964.
1964, 121p
Contract AT(04-1)-GEN-12
Unclassified report

Descriptors: (*Radiobiology, Biochemistry), (*Biochemistry, Medicine), Pharmacology, Biophysics.

UCLA-12-553 Field 6F, 6R
CFSTI Prices: HC$3.00 MF$0.75

California Univ., Los Angeles. Lab. of Nuclear Medicine and Radiation Biology.
ECOLOGY OF THE NEVADA TEST SITE. I. GEOGRAPHIC AND ECOLOGIC DISTRIBUTIONS OF THE VASCULAR FLORA (ANNOTATED CHECKLIST),
by Janice C. Beatley. Apr 65, 67p
Contract AT(04-1)-GEN-12
Unclassified report

Descriptors: (*Radiation effects, Plants), (*Ecology, Radiobiology).

UCRL-11614 Field 6R
CFSTI Prices: HC$5.00 MF$1.00

Lawrence Radiation Lab., Univ. of California, Berkeley.
REVERSIBLE AND IRREVERSIBLE EFFECTS OF IONIZING RADIATIONS ON THE REPRODUCTIVE INTEGRITY OF MAMMALIAN CELLS CULTURED IN VITRO.
Doctoral thesis,
by Paul Wilson Todd. 18 Aug 64, 152p
Contract W-7405-eng-48
Unclassified report

Descriptors: (*Tissue culture cells, Radiation effects), (*Radiation effects, Tissue culture cells).

UCRL-11683 Field 6A, 6M
CFSTI Prices: HC$2.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Berkeley.
MOLECULAR REGULATION AND ITS POSSIBLE EVOLUTIONARY SIGNIFICANCE,
by V. Moses and M. Calvin. Sep 64, 45p
Rept. no. CONF-640906-1 Unclassified report
Contract W-7405-eng-48
Presented at the Symposium on Evolving Genes and Proteins held at the Institute of Microbiology, Rutgers University, New Brunswick, N. J., 17-18 Sep. 64.

Descriptors: (*Enzymes, Biosynthesis), (*Microorganisms, Biochemistry).

UCRL-12492 Field 6R
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
SPECIAL PROBLEMS OF THYROID DOSIMETRY CONSIDERATIONS OF I 131 DOSE AS A FUNCTION OF GROSS SIZE AND INHOMOGENEOUS DISTRIBUTION,
by Lynn R. Anspaugh. 25 Mar 65, 22p
Contract W-7405-eng-48
Unclassified report

Descriptors: (*Thyroid gland, Radiation effects), (*Iodine, Radiobiology).

UR-660 Field 6C, 6P
CFSTI Prices: HC$1.00 MF$0.50

Rochester Univ., N. Y. Atomic Energy Project.
A MEMBRANE FILTER TECHNIQUE FOR ENUMERATING MEGAKARYOCYTES,
by J. E. Traynor and M. Ingram. 15 Dec 64, 9p
Contract W-7405-eng-49
Unclassified report

Descriptors: (*Blood platelets, Counting methods), (*Blood cells, Counting methods), (*Blood counts, Filters(Fluid)), (*Filters(Fluid), Blood counts).

UR-661 Field 6R
CFSTI Prices: HC$1.00 MF$0.50

Rochester Univ., N. Y. Atomic Energy Project.
RETENTION OF STRONTIUM-90 BY FETAL AND NEWBORN RATS,
by B. J. Hopkins, R. C. Baxter and L. W. Tuttle.
9 Nov 64, 15p Unclassified report
Contract W-7401-eng-49
Descriptors: (*Rats, Radiological dosage), (*Strontium, Radiation effects).

UR-662 Field 6C
CFSTI Prices: HC$2.00 MF$0.50

Rochester Univ., N. Y. Atomic Energy Project.
CHANGES IN KINETICS OF ERYTHROPOIESIS AS REFLECTED IN FREQUENCY DISTRIBUTION OF ERYTHROCYTE VOLUMES OF ACUTELY BLED DOGS,
by G. F. Orthey and M. Ingram. 4 Dec 64, 35p
Contract W-7401-eng-49

Unclassified report

Descriptors: (*Dogs, Erythrocytes), (*Erythrocytes, Dogs).

07. Chemistry

AGN-8121 Field 7D, 11F
CFSTI Prices: HC$1.00 MF$0.50

Aerojet-General Nucleonics, San Ramon, Calif.
ALKALI METALS EVALUATION PROGRAM.
Quarterly progress rept. 1 Jul-30Sep 64,
by C. R. Fisher and P. Y. Achener. Oct 64, 23p
Contract AT(04-3)-368

Unclassified report

Descriptors: (*Alkali metals, Thermodynamics), (*Thermodynamics, Alkalimetals), Heat transfer, Boiling.

AGN-8131 Field 7D
CFSTI Prices: HC$2.00 MF$0.50

Aerojet-General Nucleonics, Sam Ramon, Calif.
ALKALI METALS EVALUATION PROGRAM.
Quarterly progress rept. 1 Oct 31 Dec 64,
by C. R. Fisher and P. Y. Achener. Jan 65, 28p
Contract AT(04-3)-368

Unclassified report

Descriptors: (*Alkali metals, Thermodynamics), (*Transport properties, Alkali metals).

BNL-7965 Field 7D, 11F
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
INTERPRETATION OF THE SOFT X-RAY EMISSION SPECTRUM OF LITHIUM METAL.
by Bernard Mozer and D. A. Goodings. 1963, 19p
Contract AT(30-2)-GEN-16

Unclassified report

Descriptors: (*Lithium, X-ray spectrum).

CEND-525 Field 7B
CFSTI Prices: HC$1.00 MF$0.50

Combustion Engineering, Inc., Windsor, Conn. Nuclear Div.
INVESTIGATION OF CATALYTIC RECOMBINATION OF RADIOLYTIC OXYGEN AND HYDROGEN.
Quarterly rept. no. 5, Oct - Dec 64,
by Thomas C. Sawyer and F. M. Stern. 10 Jan 65, 19p
EURAEC-1330
Contract AT(40-1)-3151

Unclassified report

Descriptors: (*Oxygen, Hydrogen), (*Recombination reactions, Catalyts).

CONF-650214-1 Field 7B, 7D, 14B
CFSTI Prices: HC$1.00 MF$0.50

Knolls Atomic Power Lab., Schenectady, N. Y.
X-RAY EMISSION ANALYSIS,
by P. D. Zemany. 18 Feb 65, 11p Unclassified report
Contract W-31-109-eng-52
Presented at the American Chemical Society meeting, Troy, N. Y.

Descriptors: (*Chemical analysis, X-rays), (*X-ray spectroscopy, Chemical analysis).

IITRI-578P15-12 Field 7E, 18B
CFSTI Prices: HC$3.00 MF$0.75

IIT Research Inst., Chicago, Ill. Technology Center.
RESEARCH ON A HOT-ATOM CATION-DEFIXATION METHOD FOR THE PRODUCTION OF ENRICHED CO-60 AND BA-139,
by P. Y. Feng. 4 Jan 65, 61p
Contract AT(11-1)-578

Unclassified report

Descriptors: (*Cobalt, Radioactive isotopes), (*Radioactive isotopes, Barium).

IS-1117 Field 7B
CFSTI Prices: HC$1.00 MF$0.50

Ames Lab., Iowa State Univ. of Science and Tech.
THE DETERMINATION OF TRACE AMOUNTS OF TANTALUM AND TUNGSTEN IN METALS,
by A. F. Voigt, G. L. Jewett, and E. C. Jacobson.
1 Mar 65, 17p CONF-650405-2
Contract W-7405-eng-82

Unclassified report

Presented at the International Conference on Modern Trends in Activation Analysis, College Station, Tex. 19-22 Apr 65.

Descriptors: (*Tantalum, Analysis), (*Tungsten, Analysis).

IS-T-6 Field 7B, 7C, 9B
CFSTI Prices: HC$3.00 MF$0.75

Ames Lab., Iowa State Univ. of Science and Tech.
COMPUTER SOLUTION OF SOLVENT EXTRACTION CASCADE CALCULATIONS FOR THE RARE-EARTH NITRATE - TBP - NITRIC ACID SYSTEM,
Masters thesis,
by Roger Frank Sebenik. Feb 65, 73p
Contract W-7405-eng-82

Unclassified report

Descriptors: (*Rare earth compounds, Solvent extraction), (*Solvent extraction, Programming(Computers)), (*Programming(Computers), Solvent extraction), (*Nitric acid, Solvent extraction).

K-D-1780 Field 7A
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge Gaseous Diffusion Plant, Tenn.
DESALINATION OF SEA WATER — EVAPORATOR PLANTS,
by B. E. Mitchell. 1 May 63, 56p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Sea water, Desalination), (*Desalination, Sea water).

LA-3291 Field 7D
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
ARCHPRO: A COMPUTER PROGRAM FOR THE COMPUTATION OF MOLECULAR WEIGHTS BY THE ARCHIBALD METHOD,
by G. R. Shepherd, P. N. Dean, and B. J. Noland.
8 Apr 65, 16p
Contract W-7405-eng-36

Unclassified report

Descriptors: (*Molecular weight, Programming-(Computers)), (*Programming(Computers), Molecular weight).

MIT-905-10 Field 7E
CFSTI Prices: HC$1.00 MF$0.50

Massachusetts Inst. of Tech., Cambridge. Dept. of Chemistry.
RADIOCHEMICAL SEPARATION OF TIN AND ANTIMONY BY AN INITIAL PHOSPHATE PRECIPITATION STEP,
by M. P. Menon, M. K. Aras, and J. W. Irvine, Jr.
8 Jun 64, 10p
Contract AT(30-1)-905

Unclassified report

Descriptors: (*Radiochemistry, Chemical precipitation), (*Phosphates, Chemical precipitation), Tin, Antimony.

MIT-2249-1 Field 7D, 7C
CFSTI Prices: HC$7.00 MF$2.00

Massachusetts Inst. of Tech., Cambridge. Dept. of Nuclear engineering.
RATE OF EXCHANGE OF DEUTERIUM BETWEEN WATER AND DISSOLVED HYDROGEN IN PRESENCE OF DIETHYLAMINE,
by Takanobu Ishida and Manson Benedict.
Feb 64, 331p MITNE-44; DSR-8069 Unclassified report
Contract AT(30-1)-2249
Descriptors: (*Exchange reactions, Deuterium), (*Deuterium, Water), Hydrogen, Amines.

NYO-2007-8 Field 7E
CFSTI Prices: HC$2.00 MF$0.50

Carnegie Inst. of Tech., Pittsburgh, Pa.
RADIATION CHEMISTRY.
Progress rept.,
by Gilbert J. Mains. 29 Jan 65, 42p
Contract AT(30-1)-2007

Unclassified report

Descriptors: (*Radiation chemistry, Scientific research).

ORNL-3764 Field 7B
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
STUDIES ON EFFECTS OF DEPOSITION CONDITIONS AND HEAT TREATMENT ON THE PROPERTIES OF PYROLYTIC CARBON.
Master's thesis,
by Ji Young Chang. Mar 65, 90p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Carbon, Physical properties).

ORNL-TM-432 Field 7A
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
PRELIMINARY BACKGROUND STUDIES OF THE PROSPECTS FOR ECONOMICAL DESALINATION OF SEA WATER USING NUCLEAR ENERGY,
by R. P. Hammond. 1 Nov 62, 33p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Desalination, Sea water), (*Nuclear energy, Desalination).

ORNL-TM-465 Field 7D, 18L
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
PROSPECTS FOR SEA-WATER DESALINATION WITH NUCLEAR ENERGY. AN EVALUATION PROGRAM,
by Gale Young, Philip R. Hammond, and I. Spiewak.
Jan 63, 32p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Sea water, Desalination), (*Desalination, Nuclear energy).

ORNL-TM-657 Field 7D
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn. Isotopes Development Center.
SEPARATION OF CERIUM-144 FROM OTHER RARE EARTHS BY ELECTROLYTIC OXIDATION AND DIFFERENTIAL EXTRACTION,
by R. E. McHenry. Feb 65, 14p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Cerium, Oxidation), (*Electrolysis, Oxidation), Rare earth elements.

ORNL-TM-1027 Field 7D
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn. Chemical Technology Div.
CHEMICAL TECHNOLOGY DIVISION, UNIT OPERATIONS SECTION MONTHLY PROGRESS REPORT, AUGUST - SEPTEMBER 1964,
by M. E. Whatley, P. A. Haas, R. W. Horton, and C. D. Watson. Mar 65, 35p Unclassified report
Contract W-7405-eng-26
Descriptors: (*Sodium compounds, Fluorides), (*Sorption, Sodium compounds), Surface area.

ORNL-TM-1058 Field 7B, 7C
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn. Isotopes Development Center.
THE EFFECT OF AN INERT DILUENT (HEXANE) ON THE DISTRIBUTION COEFFICIENTS OF 99M TC AND 131 I IN METHYL ETHYL KETONE/WATER AND METHYL ETHYL KETONE/2 M NH4OH,
by J. J. Pinajian. Apr 5, 10p
Contract W-7405-eng-2

Unclassified report

Descriptors: (*Technetium, Ketones), (*Iodine, Ketones), Distribution.

ORNL-TM-1059 Field 7B, 7C
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn. Isotopes Development Center.
THE EXTRACTION OF INDIUM FROM HYDROCHLORIC ACID SOLUTIONS WITH N-AMYL AND N-OCTYL ALCOHOL AND ITS POSSIBLE USE FOR SEPARATING TIN AND INDIUM,
by K. R. Balesubramaniam and J. J. Pinajian.
Apr 65, 8p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Indium, Separation), (*Alcohols, Hydrochloric acid).

ORNL-TM-1071 Field 7B
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
HIGH-PURITY POTASSIUM CHLORIDE,
by R. B. Quincy, Jr. and D. E. Lavalle. Mar 65, 16p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Potassium compounds, Synthesis-(Chemistry)), (*Chlorides, Synthesis(Chemistry)).

ORNL-TM-1092 Field 7E, 7D
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn. Chemical Technology Div.
CHEMICAL TECHNOLOGY DIVISION, UNIT OPERATIONS SECTION MONTHLY PROGRESS REPORT, JANUARY 1965,
by M. E. Whatley, P. A. Haas, R. W. Horton, and C. D. Watson. Apr 65, 13p Unclassified report
Contract W-7405-eng-26

Descriptors: (*Radiochemistry, Remote control systems), (*Salts, Melting).

Patent 3,196,197 Field 7A, 11I

PROCESS FOR SHIPPING RIGID POLYURETHANE FOAM.
Patent assigned to Army,
by Soloman Goldfein. 20 Jul 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Isocyanate plastics, Transportation), (*Chemical engineering, Isocyanate plastics), Foams, Compressive properties, Expanded plastics, Ketones, Solutions, Handling, Patents.

The rigid polyurethane foam is compressed to a fraction of its original size by mechanical pressure with some heat. After shipment the product is reexpanded by immersing it in a ketone. The product is then immersed in a plastic soluble in the ketone and the ketone is evaporated to obtain the reexpanded polyurethane foam.

PB-168 011 Field 7E, 7D, 6L
CFSTI Prices: HC$1.00 MF$0.50

Commissariat a l'Energie Atomique, Cadarache (France). Centre d'Etudes Nucleaires.
BIOLOGICAL MONO-CHROMATOR WITH A HIGH FLUX IN THE VISIBLE SPECTRUM (Un Monochromateur Biologique a Haut Flux Dans le Visible),
by Marcel Andre and Pierre Guerin de Montgareuil.
Apr 65, 21p Rept. no. CEA-R-2756

Unclassified report

Text in French, summary in English.

Descriptors: (*Photosyn thesis, Chromatographic analysis), (*Chromatographic analysis, Spectra(Visible + ultraviolet), Diffraction gratings, Electric arcs, Xenon, Laboratory equipment, Biological laboratories, France.

The object is to carry out research into photosynthesis using energetic illuminations similar to those employed with white light studies. The limitations are due mainly to the source. A comparison of various possible solutions has led to the choice of the sun used in conjunction with 4 large gratings. In an intermediate stage, a description is given of a medium-aperture monochromator with a 3 kW xenon arc and a single grating. With this set-up it is possible to obtain the following performance, given as an example; energy illumination, 1.3 mW/sq cm over a surface of 50 sq cm and for a bandwidth at half-height of 50 A. (Author)

PB-168 140 Field 7B
CFSTI Prices: HC$3.00 MF$0.75

Commissariat a l'Energie Atomique, Fontenay-Aux-Roses (France). Centre d'Etudes Nucleaires.
PREPARATION OF URANIUM-BASED OXIDE CATALYSTS. (Preparation de Catalyseurs oxydes a Base d'Uranium).
Doctoral thesis,
by Rene Bressat. 1965, 67p Rept. no. CEA-R-2817

Unclassified report

Text in French. Attached summary in English.

Descriptors: (*Catalysts, Uranium compounds), (*Uranium compounds, Dioxides), Uranyl radicals, Oxalates, Thorium compounds, Complex compounds, Crystal structure, Oxidation, France, Decomposition.

The thermal decomposition of uranyl and uranium IV oxalates was studied as a mean of producing uranium dioxide. The main intermediate phases of the decompositions were isolated, and the lines of their X-ray diffraction patterns were indexed. The oxides produced by the decomposition are ill-defined and unstable: they strongly absorb atmospheric oxygen with modification of the composition and, in certain cases, of the structure (pyrophoric oxide). With a view to obtaining stable oxides, mixed uranium-thorium oxalates were prepared. The mixed oxide obtained from the thermal decomposition of an oxalate UxTh(1-x)(C2O4)2.2H2O at 500 C for 24 hours in a current of oxygen leads to a cubic structure which is well-defined both in the bulk and superficially when x is less than 0.35. Above this atomic concentration of uranium, some uranium moves out of the lattice in the form of UO3 or U3O8 according to the temperature. The mixed oxide is not stoichiometric (UxTh(1-x)O(2+y)) and the average degree of oxidation of the uranium varies with the temperature and partial oxygen pressure. By dissolving the mixed oxalates in a concentrated solution of ammonium oxalate, the catalyst may be deposited on a support, but differences in solubilities of the Th and U(IV) oxalates in the ammonium oxalate make impossible the preparation of double salts formed either of Th and U and of the ammonium salt.

PB-168 290 Field 7A
CFSTI Prices: HC$3.00 MF$0.75

SOVIET-BLOC RESEARCH AND DEVELOPMENT IN FLUID SEPARATION TECHNIQUES: ABSORPTION, ADSORPTION, DISTILLATION, AND EXTRACTION.
Sep 65, 93p Rept. no. PAL-65-2
Unclassified report

Descriptors: (*Separation, Reviews), (*Adsorption, Reviews), (*Distillation, Reviews), (*Solvent extraction, Reviews), Absorption(Physical), Industrial equipment, Design, Theory, Thermodynamics, USSR.

A search of the Soviet-Bloc literature for the period 1960 to early 1964 uncovered more than 700 references to papers relating to various aspects of the general subject of separation of fluids by chemical engineering techniques. About 40 per cent of the Soviet papers found relate to absorption and adsorption, about 30 per cent to distillation, and about 15 per cent to solvent extraction, with the remainder scattered over miscellaneous subjects such as diffusion, centrifugation, evaporation, etc. Therefore, it was decided to concentrate the study on the first four subjects representing approximately 85 per cent of the Soviet publications in this field. It may be concluded that the U.S.S.R. is committed to a large and comprehensive effort in the areas of fluid separation discussed separately. The large number of authors involved suggests that the Soviets consider these areas of sufficient importance to justify the efforts of many of their technical personnel. A general conclusion is that the Soviets lag several years behind the U. S. and other Western countries in the industrial applications of fluid-separation techniques. (Author)

RPI-2714-4 Field 7D, 7B
CFSTI Prices: HC$2.00 MF$0.50

Rensselaer Polytechnic Inst., Troy, N. Y. Dept. of Materials Engineering.
ANODIC DISSOLUTION OF URANIUM,
by N. D. Greene and L. E. Kindlimann. Jan 65, 28p
Contract AT(30-1)-2714 Unclassified report

Descriptors: (*Uranium, Electrochemistry).

RPI-2714-6 Field 7D, 7B
CFSTI Prices: HC$1.00 MF$0.50

Rensselaer Polytechnic Inst., Troy, N. Y. Dept. of Materials Engineering.
ELECTRODE KINETIC STUDIES OF THORIUM,
by N. D. Greene and L. E. Kindlisana. Mar 65, 19p
Contract AT(30-1)-2714
Unclassified report

Descriptors: (*Thorium, Electrochemistry).

TID-21677 Field 7D, 7C
CFSTI Prices: HC$1.00 MF$0.50

Rutgers - The State Univ. of New Jersey, New Brunswick. Bureau of Engineering Research.
RELAXATION BEHAVIOR, MOLECULAR MOTION, AND STRUCTURE IN POLYMERS AND RELATED MATERIALS.
Progress rept. for Jun 64-Feb 65,
by J. A. Sauer. Jun 64, 15p
Contract AT(30-1)-3384 Unclassified report

Descriptors: (*Polymers, Physical properties), (*Nuclear magnetic resonance, Polymers).

UCRL-9821(rev) Field 7D
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Berkeley.
THE KINETICS OF THE HIGH-TEMPERATURE HYDROLYSIS OF MAGNESIUM FLUORIDE. PART II. INFLUENCE OF CHANGING SPECIMEN GEOMETRY, SPECIMEN TYPE, AND RESISTANCE OF THICK PRODUCT LAYERS ON THE REACTION RATE,
by Donald R. Messier and Joseph A. Pask. 7 Feb 64, 21p
Contract W-7405-eng-48
Unclassified report

Descriptors: (*Hydrolysis, Reaction kinetics), (*Magnesium compounds, Fluorides).

UCRL-11647 Field 7E, 9B
CFSTI Prices: HC$2.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Berkeley.
FORTRAN: SUBROUTINE RANGE CALCULATING THE RANGE-ENERGY RELATION FOR CHARGED PARTICLES IN CHEMICAL ELEMENTS,
by W. Peter Trower. 3 Sep 64, 30p
Contract W-7405-eng-48
Unclassified report

Descriptors: (*Programming(Computers), Radiation chemistry), (*Radiation chemistry, Programming-(Computers)).

UCRL-11850 Field 7D
CFSTI Prices: HC$3.00 MF$0.75

Lawrence Radiation Lab., Univ. of California, Berkeley.
THE THERMOCHEMISTRY OF DI- AND TRI-VALENT EUROPIUM.
Doctoral thesis,
by John L. Burnett. 18 Dec 64, 65p
Contract W-7405-eng-48
Unclassified report

Descriptors: (*Thermochemistry, Europium), (*Europium, Thermochemistry).

UCRL-11863 Field 7E, 6A
CFSTI Prices: HC$4.00 MF$1.00

Lawrence Radiation Lab., Univ. of California, Berkeley.
STUDIES ON THE STRUCTURE AND PHOTOCHEMISTRY OF CHLOROPLAST LAMELLAE.
Doctoral thesis,
by John Biggins. Jan 65, 150p
Contract W-7405-eng-48
Unclassified report

Descriptors: (*Plants(Botany), Photochemistry), (*Photosynthesis, Plants(Botany), Biochemistry.

UCRL-12054-T Field 7D
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
AN APPROXIMATE, FINITE TEMPERATURE, THOMAS FERMI POTENTIAL,
by William Zink. Aug 64, 13p
Contract W-7405-eng-48
Unclassified report

Descriptors: (*Atomic spectroscopy, Potential theory), (*Potential theory, Atomic spectroscopy).

08. Earth Sciences and Oceanography

MITS-52 Field 8I, 13H, 8G
CFSTI Prices: HC$1.00 MF$0.50

Massachusetts Inst. of Tech., Cambridge. Dept. of Metallurgy.
ADAPTATION OF NEW RESEARCH TECHNIQUES TO MINERAL ENGINEERING PROBLEMS.
Annual progress rept. for period ending 31 Oct 64.
31 Oct 64, 12p NYO-10332
Contract AT(30-1)-956

Unclassified report

Descriptors: (*Minerals, Material separation), (*Mining engineering, Minerals).

NVO 98-1 Field 8C
CFSTI Prices: HC$2.00 MF$0.50

National Marine Consultants Div., Interstate Electronics Corp., Anaheim, Calif.
TSUNAMI WAVE MEASUREMENT, PROGRESS.
Technical rept.
Apr 64, 27p
Contract AT(26-1)-98

Unclassified report

Descriptors: (*Ocean waves, Measurement).

ORNL-TM-1108 Field 8G, 8M
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
GEOLOGY AND SOILS OF WHITEOAK CREEK BASIN, TENNESSEE,
by W. M. McMaster and H. D. Waller. May 65, 36p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Geology, Tennessee), (*Soils, Tennessee).

PB-168 110 Field 8G, 8I, 5C, 13H
CFSTI Prices: HC$3.00 MF$0.75

West Virginia Univ., Morgantown. Coal Research Bureau.
COAL-ASSOCIATED MINERALS OF THE UNITED STATES. PART 1. PENNSYLVANIA AND MARYLAND COAL-ASSOCIATED MINERAL OCCURRENCES AND MARKETS.
Coal research and development rept.,
by O. B. Bucklen, C. F. Cockrell, B. A. Donahue, J. W. Leonard, and C. R. McFadden. 1965, 96p
Rept. no. CRDR-8, pt. 1
Contract 14 01 0001 269

Unclassified report

Descriptors: (*Economic geology, Minerals), (*Coal, Economic geology), (*Minerals, Economic geology), (*Mining engineering, Coal), Pennsylvania, Maryland, Geological survey, Commerce, Industries, Maps, Graphics.

This volume is an area feasibility study which identifies within the coal regions of Pennsylvania and Maryland the location, quality, uses and marketing areas for coal-associated minerals. It is divided into two sections (1-A and 1-B). The first section (1-A) includes the coal-associated minerals of Pennsylvania while the second section (1-B) includes the coal-associated minerals of Maryland. Each section is preceded by a table of contents. Following the text of each section is a reference list and bibliography which will permit the location of information of specialized interest. Figures and tables, including location maps of industries, power plants and transportation facilities, follow the bibliography. It should be noted that in some cases, analyses of coal and/or associated minerals contained in this report include determinations which were derived from mined-out areas and therefore may be more indicative of the broad area potential rather than a precise indication of untapped mineral value. The analyses are intended to serve as a guide and not as a substitute for careful exploration of a specific site under consideration for development. (Author)

PB-168 111 Field 8G, 8I, 5C, 13H
CFSTI Prices: HC$3.00 MF$0.75

West Virginia Univ., Morgantown. Coal Research Bureau.
COAL-ASSOCIATED MINERALS OF THE UNITED STATES. PART 2. OHIO COAL-ASSOCIATED MINERAL OCCURRENCES AND MARKETS.
Coal research and development rept.,
by O. B. Bucklen, C. F. Cockrell, B. A. Donahue, J. W. Leonard, and C. R. McFadden. 1965, 99p
Rept. no. CRDR-8, pt. 2
Contract 14 01 0001 269

Unclassified report

See also PB-168 110.

Descriptors: (*Economic geology, Minerals), (*Coal, Economic geology), (*Minerals, Economic geology), (*Mining engineering, Coal), Ohio, Geological survey, Commerce, Industries, Maps, Graphics.

This volume is an area feasibility study which identifies within the coal regions of Ohio the location, quality, uses and marketing areas for coal-associated minerals. It is organized proceeding from the geologically oldest to the geologically youngest coal seam. Only those seams known to have potentially valuable associated minerals are included. Other seams not included may have potentially valuable associated minerals but information on these seams is lacking. Each seam is discussed individually and is preceded by an abstract. A general table of contents at the front of the volume lists the coal seams and their major associated minerals.

PB-168 112 Field 8G, 8I, 5C, 13H
CFSTI Prices: HC$3.00 MF$0.75

West Virginia Univ., Morgantown. Coal Research Bureau.
COAL-ASSOCIATED MINERALS OF THE UNITED STATES. PART 3. WEST VIRGINIA COAL-ASSOCIATED MINERAL OCCURRENCES AND MARKETS.
Coal research and development rept.,
by O. B. Bucklen, C. F. Cockrell, B. A. Donahue, J. W. Leonard, and C. R. McFadden. 1965, 88p
Rept. no. CRDR-8, pt. 3
Contract 14 01 0001 269

Unclassified report

See also PB-168 111.

Descriptors: (*Economic geology, Minerals), (*Coal, Economic geology), (*Minerals, Economic geology), (*Mining engineering, Coal), West Virginia, Geological survey, Commerce, Industries, Maps, Graphics.

This volume is an area feasibility study which identifies

within the coal regions of West Virginia the location, quality, uses and marketing areas for coal-associated minerals. It is organized proceeding from the geologically oldest to the geologically youngest coal seams. Only those seams known to have potentially valuable associated minerals are included. Other seams not included may have potentially valuable associated minerals but information on these seams is lacking. Each seam is discussed individually and is preceded by an abstract. A general table of contents at the front of the volume lists the coal seams and their major associated minerals.

PB-168 113 Field 8G, 8I, 5C, 13H
CFSTI Prices: HC$3.00 MF$0.75

West Virginia Univ., Morgantown. Coal Research Bureau.
COAL-ASSOCIATED MINERALS OF THE UNITED STATES. PART 4. SOUTHERN APPALACHIA COAL-ASSOCIATED MINERAL OCCURRENCES AND MARKETS (VIRGINIA, EASTERN KENTUCKY, TENNESSEE AND ALABAMA).
Coal research and development rept.,
by O. B. Bucklen, C. F. Cockrell, B. A. Donahue, J. W. Leonard, and C. R. McFadden. 1965, 61p
Rept. no. CRDR-8, pt. 4
Contract 14 01 0001 269
Unclassified report

See also PB-168 112.

Descriptors: (*Economic geology, Minerals), (*Coal, Economic geology), (*Minerals, Economic geology), (*Mining engineering, Coal), Virginia, Kentucky, Tennessee, Alabama, Geological survey, Commerce, Industries, Maps, Graphics.

This volume of the report is an area feasibility study which identifies within the coal regions of the Southern Appalachian states of Virginia, Eastern Kentucky, Tennessee and Alabama the location, quality, uses and marketing areas for coal-associated minerals. It is organized according to states, each state being discussed individually with the known associated minerals of potential value occurring in that state. The discussion of each state is an independent unit, containing a text followed by a selected reference list and bibliography which will permit the location of sources of information of specialized interest. Figures and tables, including location maps of industries, power plants and transportation facilities, pertinent to each state follow the bibliography. Because of a lack of coal seam correlation the texts for Virginia, Alabama and Tennessee each include an overall discussion without breakdown according to area, coal seam, or other geological factors. In the case of Eastern Kentucky, the discussion follows according to well-recognized mining districts. A general table of contents at the front of the volume list the states included and the order of their arrangement.

PB-168 114 Field 8G, 8I, 5C, 13H
CFSTI Prices: HC$5.00 MF$1.00

West Virginia Univ., Morgantown. Coal Research Bureau.
COAL-ASSOCIATED MINERALS OF THE UNITED STATES. PART 5. MID-WESTERN COAL-ASSOCIATED MINERAL OCCURRENCES AND MARKETS (ILLINOIS, WESTERN KENTUCKY, INDIANA, MISSOURI, KANSAS, IOWA, AND TEXAS).
Coal research and development rept.,
by O. B. Bucklen, C. F. Cockrell, B. A. Donahue, J. W. Leonard, and C. R. McFadden. 1965, 151p
Rept. no. CRDR-8, pt. 5
Contract 14 01 0001 269 Unclassified report

See also PB-168 113.

Descriptors: (*Economic geology, Minerals), (*Coal, Economic geology), (*Minerals, Economic geology), (*Mining engineering, Coal), Illinois, Kentucky, Indiana, Missouri, Kansas, Iowa, Texas, Geological survey, Commerce, Industries, Maps, Graphics.

This volume is organized according to states and arranged in the order of their relative coal production. The discussion of each state is set-up as an independent unit, containing a text followed by a selected reference list and bibliography which will permit the location of sources of information of specialized interest. Figures and tables, including location maps of industries, power plants and transportation facilities, pertinent to each state follow the bibliography. A general table of contents at the front of the volume lists the states included and the order of their arrangement. Because of a lack of coal seam correlation, the texts for Missouri, Iowa and Texas include an overall discussion without breakdown according to coal seam, geological age or other geological factors.

PB-168 115 Field 8G, 8I, 5C, 13H
CFSTI Prices: HC$3.00 MF$0.75

West Virginia Univ., Morgantown. Coal Research Bureau.
COAL-ASSOCIATED MINERALS OF THE UNITED STATES. PART 6. WESTERN COAL-ASSOCIATED MINERAL OCCURRENCES AND MARKETS (COLORADO, MONTANA, NEW MEXICO, NORTH DAKOTA, UTAH, SOUTH DAKOTA, WASHINGTON, AND WYOMING).
Coal research and development rept.,
by O. B. Bucklen, C. F. Cockrell, B. A. Donahue, J. W. Leonard, and C. R. McFadden. 1965, 75p
Rept. no. CRDR-8, pt. 6
Contract 14 01 0001 269
See also PB-168 114. Unclassified report

Descriptors: (*Economic geology, Minerals), (*Coal, Economic geology), (*Minerals, Economic geology), (*Mining engineering, Coal), Colorado, Montana, New Mexico, North Dakota, Utah, South Dakota, Washington, Wyoming, Geological survey, Commerce, Industries, Maps, Graphics.

This volume is organized according to states, each state being discussed individually with the known associated minerals of potential value occurring in the states. The discussion of each state is set up as an independent unit, containing a text followed by a selected reference list and bibliography which will permit the location of sources of information of specialized interest. Because of a lack of coal seam correlation the text for each state includes an overall discussion without breakdown according to area, coal seam, or other geological factors. A general table of contents at the front of the volume lists the states included and the order of their arrangement.

PB-168 205 Field 8J, 8C
CFSTI Prices: HC$4.00 MF$1.00

Texas A. and M. Univ., College Station. Dept. of Oceanography and Meteorology.
EDDY DIFFUSION IN THE ANTARCTIC INTERMEDIATE WATER.
Doctoral thesis,
by Albert D. Kirwan. Dec 64, 139p Reference-64-31F
Grant NSF G13664, Proj. 358
Unclassified report

Continuation of Grants NSF G18019; NSF G21525, NSF GA75.

Descriptors: (*Oceanolog, Polar regions), Oceans, Diffusion, Salinity, Geochemistry, Ocean currents, Oceanographic data.

In this paper the use of an eddy diffusivity tensor in the conservation of salt equation is investigated from two points of view. First it is found that the order of tensor assumed specifies the amount of information that can be obtained about the eddy flux. Secondly a method is developed for calculating each component of the eddy diffusivity tensor and/or its derivative from a record of the mean salinity and velocity fields. This method in essence treats the components of the diffusivity tensor as coefficients in a regression equation. This procedure allows confidence limits to be established for the tensor. In order to apply these results to observations from the ocean an objective analysis scheme was developed. This scheme provided a means for estimating the salinity and geostrophic current fields along sigma t surfaces of the Antarctic Intermediate Water. The picture of the Intermediate Water obtained from this analysis is discussed and compared with the classic Meteor reports.

PB-168 286 Field 8C, 8B
CFSTI Prices: HC$2.00 MF$0.50

Coast and Geodetic Survey, Washington, D. C.
PHOTOGRAMMETRIC MEASUREMENT OF TIDAL CURRENTS,
by Lawrence W. Swanson, Morton Keller, and Steacy D. Hicks. 1963, 29p
Unclassified report

Prepared for presentation at International Union of Geodesy and Geophysics General Assembly (13th), Berkeley, Calif., 19-31 Aug 63.

Descriptors: (*Tides, Photogrammetry), (*Photogrammetry, Hydrographic surveying), (*Hydrographic surveying, Photogrammetry), Ocean currents, Harbors, Estuaries, Aerial photography, Oceanology.

Conventional methods of measuring tidal current velocities and directions employ current meters suspended at predetermined depths from buoys anchored at a limited number of preselected locations within the area of the survey. The Coast and Geodetic Survey has determined by rather exhaustive tests that aerial photography and photogrammetric measurements can be used to supplement the conventional current meter observations to obtain a synoptic and much more detailed survey of the circulatory pattern of an entire harbor area. This paper outlines the photogrammetric method and the results obtained from combined current meter and photogrammetric tidal current surveys in several harbors and estuaries. Advantages of the photogrammetric method are enumerated and specific examples of the results obtained are presented. (Author)

PB-168 316 Field 8J, 8D, 8G
CFSTI Prices: HC$3.00 MF$0.75

Texas A and M Univ., College Station. Dept. of Oceanography and Meteorology.
GEOCHEMISTRY OF ANTARCTIC PELAGIC SEDIMENTS. Final rept.,
by Ernest E. Angino. Jul 65, 97p Reference 65-21A
Grant NSF GA-101, Proj. 363
Unclassified report

Descriptors: (*Geochemistry, Marine geology), (*Marine geology, Polar regions), (*Oceanology, Polar regions), Sedimentation, Well logging, Minerals, Uranium, Thorium.

The main objective of this study was to investigate the chemistry, especially trace element chemistry, of Antarctic glacial marine sediments. A second objective was to ascertain if it is possible to use variations in trace element content as a function of depth in the core and sediment type as an indicator of past climatic changes in the Antarctic area.

RM-4238-TAB Field 8H, 13B, 15F
CFSTI Prices: HC$2.00 MF$0.50

RAND Corp., Santa Monica, Calif.
FLOODS AND THE POSTATTACK BIOLOGY PROBLEM. A PRELIMINARY SURVEY,
by H. H. Mitchell. Jan 65, 30p
Contract AT(04-3)-414
Unclassified report

Descriptors: (*Floods, Nuclear warfare), (*Nuclear warfare, Floods), (*Sanitary engineering, Floods).

RME-99 Field 8G
CFSTI Prices: HC$4.00 MF$0.75

Grand Junction Office (AEC), Colo. Production Evaluation Div.
MINERALOGY OF THE CAMERON AREA, COCONINO COUNTY, ARIZONA,
by S. Ralph Austin. Sep 64, 102p
Unclassified report

Descriptors: (*Mineralogy, Arizona), (*Uranium, Mineralogy).

09. Electronics and Electrical Engineering

AD-421 935 Field 9A, 20L
CFSTI Price: HC$2.00

Stanford Electronics Labs., Stanford Univ., Calif.
A THIN-FILM, NICKEL OXIDE SWITCH,
by W. E. Beadle. Aug 63, 46p
Rept. nos. SEL-63-075, Technical rept. no. TR-4719-1
Contract Nonr22524, Proj. NR373 360
Unclassified report

Descriptors: (*Electronic switches, Metal films), (*Semiconductor devices, Electronic switches), Nickel compounds, Oxides, Solid state physics, Manufacturing methods, Switching circuits, Signals, Transients, Oxidation, Semiconducting films, Nickel alloys, Semiconductors, Electrical impedance, Resistance(Electrical).

This report describes an electrically actuated, solid-state switch. The switch is a two-terminal device consisting of a thin nickel oxide film separating two ohmic contacts. The gross properties of the switch are (1) reversible switching between two impedance levels (ON: 100 ohms; OFF: 25 megohms), and (2) electrical actuation of the switch (turn-on: 500-v, 40 microsec pulse; turn-off: 300-ma, 10-nsec pulse). The fabrication of the device from thermally grown nickel oxide is described. A switching model for the device is established on the basis of a series of experiments, and theoretical calculations of switching times using this model are made. Limited life-times observed for the device suggest applications requiring single-shot operations which utilize the insulating properties of the NiO film. (Author)

AD-425 696 Field 9A, 13H
CFSTI Prices: HC$3.00

General Electric Co., Auburn, N. Y. Rectifier Components Dept.
THE IMPROVEMENT OF PRODUCTION TECHNIQUES TO INCREASE THE RELIABILITY OF DIFFUSED SILICON CONTROLLED SWITCHES.
Quarterly progress rept. no. 1, 1 Jul-30 Sep 63, by J. N. Frank, R. C. Rome, H. Wawrousek, and W. R. Comstock. 30 Sep 63, 55p
Contract DA36 039AMC03619E

Unclassified report

Descriptors: (*Electronic switches, Crystal rectifiers), (*Semiconductor devices, Electronic switches), Silicon, Diffusion, Platings, Reliability(Electronics), Fixed contacts, Dielectrics, Rubber coatings, Packaging, Welding, Silicon alloys, Gold alloys, Impurities, Phosphorus, Tungsten, Containers.

The report covers the work performed on an all-diffused rectifier subassembly, the device package, reliability testing equipment, and the materials complying with preestablished parameters. A PERT analysis depicts the progress of this program and provides certain conclusions on the work performed. (Author)

AD-443 189 Field 9E, 9A
CFSTI Price: HC$3.00

Stanford Electronics Labs., Stanford Univ., Calif.
CHARACTERISTICS OF PHOTON-COUPLED SYSTEMS, by Irwin Wunderman. Apr 64, 83p
Rept. nos. SU-SEL-64-016, Technical rept. no. TR-4814-1
Contract Nonr22524, Proj. NR373 360

Unclassified report

Descriptors: (*Amplifiers, Diodes(Semiconductor), Photons, Electron optics, Input-output devices, Circuits, Computer logic, Switching circuits, Optical equipment, Photoelectric cells(Semiconductor), Solar cells.

When appropriately fabricated gallium arsenide diodes are biased in the forward direction, they emit a narrow band of radiation in the near infrared. With the current state of technology, it is feasible to incorporate these devices into active electronic amplifiers. The properties and capabilities are described of circuits which can be made by mating these emitting sources to suitable photodetectors, forming 'photon-coupled pairs.' The unique characteristics of such configurations are electrical isolation of input and output circuits, and unilateral signal transfer. Two specific application examples are discussed in detail. The first is a linear amplifier in which the input signal is differentially applied to two forward-biased, injection-luminescent diodes. The second example of a photon-coupled device is called a logic translator. Several sample applications are given.

ANL-6993 Field 9B
CFSTI Prices: HC$3.00 MF$0.50

Argonne National Lab., Ill.
WHADDAYADOO WITH THE DIDJERIDOO. A GENERALIZED ASI-2100 PROGRAM FOR HANDLING DATA FROM THE ND-160 PULSE-HEIGHT ANALYZER, by D. S. Gemmell. Jan 65, 53p
Contract W-31-109-eng-38

Unclassified report

Descriptors: (*Pulse height analyzers, Data processing systems), (*Programming(Computers), Data processing systems).

ANL-7016 Field 9B
CFSTI Prices: HC$3.00 MF$0.75

Argonne National Lab., Ill.
PROGRAM CATALOG WITH PERMUTED DESCRIPTION INDEX FOR CDC CO-OP COMPUTERS, by N. J. Purcell. Mar 65, 92p
Contract W-31-109-eng-38

Unclassified report

Descriptors: (*Programming(Computers), Catalogs), (*Indexes, Programming(Computers)).

ANL-7021 Field 9B
CFSTI Prices: HC$2.00 MF$0.50

Argonne National Lab., Ill.
NAMED STORAGE: A DYNAMIC STORAGE-ALLOCATION SCHEME WITH MANIPULATIVE ROUTINES, by Stanley Cohen. Apr 65, 35p
Contract W-31-109-eng-38

Unclassified report

Descriptors: (*Data storage systems, Computers).

CVNA-223 Field 9B, 18L
CFSTI Prices: HC$5.00 MF$1.25

Westinghouse Electric Corp., Pittsburgh, Pa. Atomic Power Div.
CAVIAR: CAROLINAS VIRGINIA ANALYSIS AND DATA REDUCTION CODE, by Raymond J. Nath. Mar 65, 162p
Contract AT(30-1)-2289

Unclassified report

Descriptors: (*Programming(Computers), Power reactors), (*Power reactors, Programming(Computers)).

IS-1152 Field 9A
CFSTI Prices: HC$3.00 MF$0.50

Ames Lab., Iowa State Univ. of Science and Tech.
LOW NOISE NARROW-BAND AMPLIFICATION WITH FIELD EFFECT TRANSISTORS, by Louis Mourland, Jr. and Wayne A. Rhinehart. Feb 65, 58p
Contract W-7405-eng-82

Unclassified report

Descriptors: (*Transistor amplifiers, Narrowband).

KAPL-M-6433 Field 9B
CFSTI Prices: HC$3.00 MF$0.75

Knolls Atomic Power Lab., Schenectady, N. Y.
GALS4: GENERAL ANALYSIS OF LINEAR SYSTEMS, by Gerhard O. Mueller and James A. Warrington. 15 Dec 64, 68p KAPL-M-EC-44
Contract W-31-109-eng-52

Unclassified report

Descriptors: (*Programming(Computers), Linear systems), (*Linear systems, Programming(Computers)), (*Integral transforms, Programming(Computers)).

NAA-SR-MEMO-10692 Field 9B, 12A
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.

A TECHNIQUE FOR SOLVING DYNAMICS PROBLEMS BY DIGITAL COMPUTATION,
by R. W. Winson. 2 Nov 64, 8p
Contract AT(11-1)-GEN-8
Unclassified report

Descriptors: (*Dynamics programming, Computers), (*Computers, Dynamic programming).

NYO-1480-2 Field 9B
CFSTI Prices: HC$6.00 MF$1.25

AEC Computing and Applied Mathematics Center, New York Univ., N. Y.
ACTIVITIES OF THE ENGINEERING RESEARCH LABORATORY.
Rept. for 1 Jul 63-30 Jun 64, 1 Aug 64, 222p
Contract AT(30-1)-1480
Unclassified report

Descriptors: (*Computers, Engineering).

NYO-1480-9 Field 9B
CFSTI Prices: HC$4.00 MF$0.75

AEC Computing and Applied Mathematics Center, New York Univ., N. Y.
THE NU-SPEAK SYSTEM,
by Judith Glasner, Stanley Ocken, David Rosenberg, and Alan Silverman. Nov 64, 107p
Contract AT(30-1)-1480
Unclassified report

Descriptors: (*Programming languages, Control sequences), (*Programming(Computers), Programming languages).

Patent 3,184,830 Field 9A

MULTILAYER PRINTED CIRCUIT BOARD FABRICATION TECHNIQUE.
Patent assigned to Army,
by Weldon V. Lane and Edmund E. Malecki. 25 May 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Printed circuits, Modules(Electronic)), Sandwich construction, Packaging, Bonding, Miniature electronic equipment, Laminates.

A composite laminated circuit unit is provided which has a plurality of individual printed circuit boards each having metallic circuits on it to make functional connection with at least a portion of an electronic system. The unit is useful in complex systems and in miniaturized modular systems because of its space saving aspect.

Patent 3,196,441 Field 9E

SCANNING ANTENNA HAVING A CYLINDRICAL SPLASH PLATE FOR PROVIDING LINEAR BEAM MOTION.
Patent assigned to Navy,
by Alan R. Mace and Jacob Tellier. 20 Jul 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Antennas, Radar scanning), Antenna components, Cylindrical bodies, Waveguides, Scanning, Configuration, Beams(Electromagnetic), Rotation, Helixes.

Rapid linear antenna beam scanning is obtained by use of a stationary reflector and waveguide feed by rotating a cylindrical splash plate that is mounted in front of the waveguide feed. A spiral trough is provided around the periphery of the cylindrical splash plate and various types of scan, such as sawtooth, linear, or sine wave, are achieved depending upon the particular configuration of the trough. The trough in the cylindrical splash plate may be either physical or electrical.

Patent 3,197,552 Field 9E, 13J

FLEXIBLE BASE ASSEMBLY.
Patent assigned to Navy,
by Henry J. Flair. 27 Jul 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Antenna components, Flexible couplings), (*Submarine antenna, Antenna components), Patents.

The flexible base assembly maintains the stress on a whip antenna within tolerable limits. The whip antenna is pivoted into the drag stream by the flexible base assembly. The assembly is mounted on a submarine.

Patent 3,197,693 Field 9C, 11F, 18J

NONDESTRUCTIVE EDDY CURRENT SUBSURFACE TESTING DEVICE PROVIDING COMPENSATION FOR VARIATION IN PROBE-TO-SPECIMEN SPACING AND SURFACE IRREGULARITIES.
Patent assigned to AEC,
by Hugo L. Libby. 27 Jul 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Probes(Electromagnetic), Metals), (*Structural properties, Metals), (*Non-destructive testing, Structural properties), Test equipment, Thickness, Surface properties, Reactor fuel cladding, Patents.

The instrument is used for the nondestructive testing of metal samples. The effects of surface bumps on metal samples is negated. The probe consists of two coils, an inner coil and an outer coil mounted coplanar and coaxially with respect to each other. The basic control circuit applied to the probe includes an oscillator, an adjustable phase shift network and two amplitude controls or power amplifiers. The instrument may be used to monitor the thickness of metal cladding on nuclear fuel elements.

Patent 3,197,717 Field 9E

SYMMETRICAL VARIABLE FREQUENCY ASTABLE MULTIVIBRATOR.
Patent assigned to Army,
by Paul Wilson Redcay. 27 Jul 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Relaxation oscillators, Transistors), Waveform generators, Patents.

A transistor oscillator is disclosed in which the pulse output waveform is improved and remains symmetrical although the pulse repetition frequency is varied. A pair of junction transistors are connected to form a direct coupled amplifier.

PB-168 172 Field 9C, 9E
CFSTI Prices: HC$1.00 MF$0.50

Boeing Co., Seattle, Wash. Aero-Space Div.
HIGH SENSITIVITY PREAMPLIFIER HS/6-A (HUGHES PRODUCTS).
Technical manual instrument calibration procedure, AA-23.
15 May 65, 16p
Contract N123 62861 35056A
NAVWEPS 17-20AA-23
Unclassified report

Descriptors: (*Preamplifiers, Calibration), (*Test equipment(Electronics), Preamplifiers), Oscilloscopes, Instruction manuals.

The manual describes the calibration procedure for the Hughes Products HS/6-A, high sensitivity preamplifier, referred to as the Test Instrument. The Test Instrument is a high sensitivity, differential preamplifier, designed for the vertical channel of the Hughes type 104 Memoscope oscilloscope. (Author)

PB-168 258 Field 9A, 20I
CFSTI Prices: HC$5.00 MF$1.00

Utah Univ., Salt Lake City. Microwave Device and Physical Electronics Lab.
PLASMA COUPLING MEDIUM FOR A TRAVELING-WAVE TUBE AMPLIFIER,
by Verle A. Gilson and Curtis C. Johnson. Jul 65, 162p
Technical rept. no. NSF-9
Grants NSF G15017, NSF GP843
Unclassified report

Descriptors: (*Traveling-wave tubes, Plasma medium), (*Plasma medium, Traveling-wave tubes), Plasma oscillations, Microwave amplifiers, Cyclotron waves, Electron beams, Waveguide couplers.

The effects of a plasma medium in an axial d-c magnetic field on Pierce's beam coupling impedance of a traveling-wave tube are investigated. The plasma's electron cyclotron frequency is treated as a primary variable and the plasma filling the hole region was selected for the slow-wave circuit. Theoretical calculations for the configuration show that the beam coupling can be greatly enhanced when the cyclotron frequency is near but greater than the applied frequency. The amount of increased coupling is dependent upon the relative size of the plasma frequency with respect to the applied frequency but substantial amounts are predicted when the plasma frequency is significantly less than the applied frequency. Experimental results are included. (Author)

PB-168 319 Field 9A
CFSTI Prices: HC$5.00 MF$1.00

Michigan Univ., Ann Arbor. Electron Physics Lab.
A SMALL-SIGNAL FIELD-THEORY ANALYSIS OF CROSSED-FIELD AMPLIFIERS,
by Bernard Hershenov. Mar 59, 168p
Technical rept. no. TR-29; 2854-1-T
Contract DA36 039sc78260, Projs. 2854, 3-99-15-104
AD 218 101 Unclassified report

Descriptors: (*Crossed field devices, Amplifiers), (*Amplifiers, Crossed field devices), (*Field theory, Crossed field devices), Mathematical analysis, Differential equation, Electron tubes, Electron beams, Signals, Electric fields, Magnetic fields.

This study is a small-signal field-theory analysis of the forward-wave interaction of an electron stream, in crossed d-c electric and magnetic fields, with a slow TM-wave. The analysis treats the input-boundary problem and the circuit susceptance in a new way. The differential equation describing the perturbed electron stream model is derived in a general manner and is then reduced to the well-known slow-wave form. The solutions of this equation are expressed in power series expansions in the neighborhoods of the synchronous and cyclotron singularities. The slow-wave structure is represented as a smooth, lossless dielectric sheet. The circuit susceptance is expressed in terms of the propagation constants of the resultant waves. The fields in the stream are matched to those outside, and dispersion equations for both the near-synchronous and the cyclotron waves are obtained. The near-synchronous dispersion equation is solved for both thick and thin streams in the presence and absence of a slow-wave circuit. The cyclotron-wave dispersion equation is solved for a thin stream.

PB-168 321 Field 9C
CFSTI Prices: HC$1.00 MF$0.50

Boeing Co., Seattle, Wash. Aero-Space Div.
ELECTRONIC SWITCH TS-433/U DUMONT LABORATORIES 185 TS-433A/U DUMONT LABORATORIES 185ATS-433B/U DUBROW 118 TS-433( )/U.
Technical manual instrument calibration procedure, AG-74.
1 May 65, 13p
Contract N123 62861 35056A Unclassified report
NAVWEPS 17-20AG-74
Descriptors: (*Electronic switches, Calibration), (*Calibration, Electronic switches), Instruction manuals, Test methods, Test equipment.

The procedure describes the calibration of the TS-433/U, 433( )/U, 433A/U, 433B/U, and their commericial equivalents; Dumont 185, 185A, and Dubrow 118 Electronic Switches, which provide switching speeds from 10 to 2000 cps and square wave outputs from 10 cps to 500 cps.

SC-R-64-1358 Field 9E
CFSTI Prices: HC$2.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
THE TRANSMITTING AND RECEIVING CHARACTERISTICS OF A WIDE-ANGLE BIOCONICAL ANTENNA WITHIN ONE OR TWO IMPERFECTLY CONDUCTING CONCENTRIC SPHERICAL SHELLS,
by Charles W. Harrison, Jr. and Clayborne D. Taylor.
Aug 64, 36p Unclassified report
Contract AT(29-1)-789
Descriptors: (*Biconical antennas, Radiation patterns), (*Radomes, Attenuation).

SC-TM-64-1784 Field 9B
CFSTI Prices: HC$3.00 MF$0.75

Sandia Lab., Albuquerque, N. Mex.
AUTOMATED PLOTTING OF FLOW CHARTS ON A SMALL COMPUTER,
by H. E. Anderson. Jan 65, 69p
Contract AT(29-1)-789 Unclassified report

Descriptors: (*Programming(Computers), Design).

SC-TM-64-2146 Field 9B
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
A MODULARIZED CARD-RACK SYSTEM FOR AUTOMATED DATA SYSTEMS,
by N. T. Radman. Dec 64, 19p
Supersedes SCTM-89-63(24) Unclassified report
Contract AT(29-1)-789
Descriptors: (*Data processing systems, Design).

SC-TM-65-5 Field 9A, 9E
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
IMPROVED PACKAGING OF ELECTRONIC AND ELECTROMAGNETIC PARTS,
by L. J. O'Connell. Jan 65, 14p
Contract AT(29-1)-789
Unclassified report

Descriptors: (*Packaged circuits, Electronics).

SCL-DC-65-52 Field 9C
CFSTI Prices: HC$3.00 MF$0.75

Sandia Corp., Livermore, Calif.
PRINTED CIRCUIT LABORATORY MANUAL.
by A. D. Andrade and E. E. Alford. Mar 65, 83p
Contract AT(29-1)-789
Unclassified report

Descriptors: (*Printed circuits, Instruction manuals), (*Electronics laboratories, Printed circuits).

SCL-DR-64-117 Field 9C, 9F
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Livermore, Calif.
CLAMP-ON DIRECT-CURRENT MONITOR,
by E. E. Skidgel. Mar 65, 18p Unclassified report
Contract AT(29-1)-789
Descriptors: (*Monitors, Circuits), (*Telemeter systems, Monitors).

UCRL-12293-T Field 9B
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
PARALLELISM IN COMPUTING SYSTEMS,
by S. Fernbech and Joseph E. Wirsching. 1964, 16p
CONF-650213-1
Contract W-7405-eng-48
Unclassified report

Presented at the IEEE Winter Convention on Military Electronics, No. 16, Los Angeles.

Descriptors: (*Computers. Multiple operation).

UCRL-12294-T Field 9B
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
COMPUTERS IN THE U. S. A. TODAY AND TOMORROW,
by S. Fernbach. 4 Jan 65, 25p CONF-650505-1
Contract W-7405-eng-48
Unclassified report
Presented at the IFIF Congress 1965 Meeting, New York.

Descriptors: (*Computers, Reviews).

10. Energy Conversion (Non-propulsive)

NYO-3429-2 Field 10A
CFSTI Prices: HC$2.00 MF$0.50

Radio Corp. of America, Lancaster, Pa. Direct Energy Conversion Dept.
THE DEVELOPMENT OF AN IMPROVED THERMIONIC ENERGY CONVERTER,
Quarterly technical rept. no. 2.
15 Jan 65, 32p
Contract AT(30-1)-3429
Unclassified report

Descriptors: (*Thermionic converters, Cesium), (*Cesium, Thermionic converters).

11. Materials

AD-285 691 Field 11B, 13H, 9A
CFSTI Prices: HC$3.00

New Jersey Ceramic Research Station, Rutgers - The State Univ., New Brunswick.
INORGANIC DIELECTRICS RESEARCH.
Progress rept. no. 3, 1 May-1 Aug 62,
by John H. Koenig, E. J. Smoke, C. J. Phillips, E. L. Kastenbein, and D. A. Lupfer. 1 Aug 62, 71p
Contract DA36 039sc89141
Unclassified report

See also AD-287 173.

Descriptors: (*Dielectrics, Ferroelectric materials), (*Ceramic materials, Dielectrics), Glass, Electrical properties, Dielectric properties, Boron compounds, Nitrides, Crystal structure, Aluminum compounds, Oxides, Extrusion, Lanthanum compounds, Silicon compounds, Sintering, Microstructure, Barium compounds, Titanates, Density.

Contents: devitrified ferroelectrics, low loss boron nitride ceramic dielectrics, transparent polycrystalline ceramics, hot extrusion, low loss microwave ceramic dielectrics.

AD-287 173 Field 11B, 9A
CFSTI Price: HC$3.00

New Jersey Ceramic Research Station, Rutgers-The State Univ., New Brunswick.
INORGANIC DIELECTRICS RESEARCH.
Progress rept. no. 2, 1 Feb-1 May 62,
by John H. Koenig, E. J. Smoke, C. J. Phillips, E. L. Kastenbein, and D. A. Lupfer. 1 May 62, 61p
Contract DA36 039sc89141
Unclassified report

See also AD-285 691.

Descriptors: (*Dielectrics, Ferroelectric materials), (*Ceramic materials, Dielectrics), Barium compounds, Titanates, Dielectric properties, Crystals, Boron compounds, Nitrides, Extrusion, Aluminum, Glass, Mica, Lanthanum compounds, Oxides, Aluminum compounds, Silicon compounds, Surface properties, Flame spraying, Electrical properties, Crystal structure.

Devitrified Ferroelectrics: Devitrified bodies made from C. P. grade flame-sprayed $BaTiO_3$ were evaluated.

The Curie temperature was shifted to higher temperatures depending upon thermal history. Under certain conditions the dielectric constant retained its higher value above the Curie temperature. Results were compared to those of C.P. so.id phase reacted BaTi03 bodies and capacitor grade devitrified bodies. Devitrified BaTi03 bodies result in the formation of extremely small crystals as compared to the large ones of the solid phase reacted BaTi03. Low loss BN ceramic dielectrics: A method for testing electrical properties under humidity conditions was developed. By use of surface resistance measurements it was indicated that the problem is one of a surface nature. Structural studies of polycrystalline ceramics: Metallization of micromodule substrates was compatible with thermal conditioning treatment. The 2 processes can be combined within a single operation to result in greatly strengthened substrates. (Author)

AD-287 174 Field 11B, 13H
CFSTI Prices: HC$2.00

New Jersey Ceramic Research Station, Rutgers Univ., New Brunswick.
INORGANIC DIELECTRICS RESEARCH.
Progress rept. no. 1, 1 Nov 61-1 Feb 62,
by John H. Koenig, E. J. Smoke, C. J. Phillips, E. L. Kastenbein, and D. R. Ulrich. .1 Feb 62, 41p
Contract DA36 039sc89141
Unclassified report

Descriptors: (*Dielectrics, Ceramic materials), (*Ceramic materials, Dielectrics), Insulating materials, Microwave frequency, Lanthanum compounds, Aluminum compounds, Silicon compounds, Silicates, Oxides, Dielectric properties, Electric properties, Density, Phase studies, Manufacturing methods, Extrusion, Crystals.

LOW LOSS MICROWAVE CERAMIC DIELECTRICS: Three compositions in the La203-A1203-Si02 system were hot-pressed and the electrical properties measured at several frequencies and temperatures. A study was made of the crystalline phases appearing in a number of compositions within the system.. Two lanthanum silicate compounds, lanthanum aluminate and mullite were found in the various compositions. Attempts to form each lanthanum silicate compound by itself are being made in order to evaluate their electrical properties. This information will be used in attempting to tailor bodies to meet the specific requirements of this project. TRANSPARENT POLYCRYSTALLINE CERAMICS: Specimens of pure alumina were pressed and sintered using a two-fire procedure. For the initial firing, one set of specimens was fired in air and one set was fired in A. The second firing of both sets was performed in A. Bulk densities of the 2 sets of specimens were measured and compared. Specimens which were initially fired in air were less dense than those fired wholly in A. HOT EXTRUSION: The hot extrusion apparatus is described and results of 3 extrusion attempts are described. (Author)

AD-444 806 Field 11F, 11J
CFSTI Prices: HC$2.00

David Taylor Model Basin, Washington, D. C.
EVALUATION OF COMMERCIALLY PRODUCED HY-80 STEEL,
by A. R. Willner and M. L. Salive. Jul 64, 47p
Rept. no. 1850
N64 33364
Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Steel, Mechanical properties), Metal plates, Hardening, Toughness, Thickness, Heat treatment, Chemical analysis, Fracture(Mechanics), Transformations, Military requirements, Metallurgy.

The purpose of this investigation was to obtain a better understanding of some of the variables which may affect the properties of HY-80 steel. The data indicate that hardenability is increased with plate thickness. Generally, plates above 3-in. thick contain less than 80 percent martensite. As the percent martensite decreases, so do the Charpy V-notch impact values at -120 F. HY-80 steel made under military specifications MIL-S-16216E and F had lower phosphorous and sulphur content than the HY-80 produced under MIL-S-16216D. The data presented herein will by used by the Model Basin for determining the individual or combined metallurgical variables which may have an effect on the mechanical properties of HY-80 steel used in model and prototype construction. (Author)

AD-446 416 Field 11F, 13J
CFSTI Prices: HC$3.00

Marine Engineering Lab., Annapolis, Md.
DEVELOPMENT OF TITANIUM ALLOYS FOR HULLS OF DEEP-DIVING VEHICLES.
Phase 1.
31 Aug 64, 58p Rept. no. MEL-194-64
Projs. S F013 01 03, S R007 01 02, Tasks 0216, 0704
Unclassified report

Descriptors: (*Titanium alloys, Submarine hulls), (*Metallurgy, Titanium alloys), Aluminum alloys, Niobium alloys, Tantalum alloys, Toughness, Welding, Metal plates, Ship plates, Tensile properties, Heat treatment, Material forming.

A summary is presented of progress on the alloy-development and physical-metallurgy aspects of a program for demonstrating the feasibility of using titanium alloys for hulls of deep-diving vehicles. The program was aimed at obtaining near-alpha-type alloys with good toughness and fabricability at a yield strength of 120 ksi. A minor effort was also made to explore higher-strength alloys. Several alloys approached the target properties, but not with consistency. The lack of consistency was associated with inadequate knowledge of optimum mill-processing schedules and physical-metallurgy kinetics. The progress to date indicates that it is feasible to use titanium alloys for deep-diving hulls. At least one alloy (Ti-7Al-2Cb-1Ta) can now be considered satisfactory, at a minimum yield strength of 105 ksi, for research-type submersibles. (Author)

AD-452 046 Field 11I, 13H
CFSTI Price: HC$3.00

Atlantic Research Corp., Alexandria, Va.
DEVELOPMENT OF A HEAT-FOAMABLE RESIN SYSTEM AND AN APPARATUS FOR PRODUCING THE FOAM.
Final rept.,
by Robert C. Kindel, William B. Noe, and Carl Hassis.
Oct 63, 64p Unclassified report
Contract DA19 129AMC6X
Available copy will not permit fully legible reproduction.

Descriptors: (*Expanded plastics, Sprays), (*Styrene plastics, Expanded plastics), (*Sprays, Expanded plastics), Particles, Powders, Foams, Heating, Impellers, Torches, Pneumatic systems, Plastic coatings, Epoxy plastics, Spheres, Acoustic insulation, Vibration isolators, Thermal insulation, Packaging, Buoyancy.

A system was developed which makes possible the generation of foamed plastics, under field conditions, from solid heat-foamable resin compositions. The prototype heat-foaming device is the Atlantic Research Mark III foam Spray Gun, consisting of a hopper, a hand-cranked impeller, and a blowtorch as the heat source. Several resin formulations, mostly based on expandable polystyrene beads, are suitable for use with the Mark III Gun. Foaming is accomplished by spraying the heat-foamable beads from the hopper through the blowtorch flame onto a target surface. The system provides an effective means of applying foams to a variety of materials including wood, fabric, metal and masonry surfaces. (Author)

ANL-6979 Field 11F, 18J
CFSTI Prices: HC$1.00 MF$0.50

Argonne National Lab., Ill.
ENGINEERING DEVELOPMENT OF FLUID-BED FLUORIDE VOLATILITY PROGRESSES. PART 7. THE CORROSION OF NICKEL IN PROGRESS ENVIRONMENTS,
by A. A. Chilenskas and G. E. Gunderson. Mar 65, 16p
Contract W-31-109-eng-38

Unclassified report

Descriptors: (*Nickel, Corrosion), (*Corrosive gases, Fluorine).

BDX-613-37 Field 11F, 7B
CFSTI Prices: HC$1.00 MF$0.50

Bendix Corp., Kansas City, Mo.
THE ANALYSIS OF TIN-INDIUM-ZINC ALLOYS,
by M. V. Davis. 21 Dec 62, 4p
Contract AT(29-1)-613

Unclassified report

Descriptors: (*Indium alloys, Chemical analysis), (*Chemical analysis, Indium alloys), Zinc alloys, Tin alloys, Volumetric analysis.

CONF-651-43 Field 11F, 20B
CFSTI Prices: HC$1.00 MF$0.50

Louisiana State Univ., Baton Rouge.
OSCILLATORY MAGNETOMORPHIC BEHAVIOR IN THE ELECTRON TRANSPORT EFFECTS OF A CD SINGLE CRYSTAL AT LOW TEMPERATURES,
by J. M. Reynolds, K. R. Efferson, and C. G. Grenier. 1964, 13p
Contract AT(40-1)-3087

Unclassified report

Descriptors: (*Cadmium, Single crystals), (*Single crystals, Cadmium).

CONF-651-45 Field 11F, 20B
CFSTI Prices: HC$1.00 MF$0.50

Louisiana State Univ., Baton Rouge.
ELECTRON TRANSPORT PHENOMENA AND OSCILLATORY BEHAVIOR IN THE LATTICE CONDUCTIVITY OF AN SB SINGLE CRYSTAL IN A MAGNETIC FIELD AT LOW TEMPERATURE,
by C. G. Grenier, Jerome R. Long, and J. M. Reynolds. 1964, 12p
Contract AT(40-1)-3087

Unclassified report

Presented at 9th International Conference on Low Temperature Physics, Columbus, Ohio, 31 Aug-4 Sep 64.

Descriptors: (*Antimony, Single crystals), (*Single crystals, Antimony).

EURAEC-1308 Field 11F
CFSTI Prices: HC$3.00 MF$0.75

Societe d'Etudes, de Recherces et d'Applications pour l'Industrie, Brussels (Belgium).
CORROSION STUDIES ON STEELS IN WATER AND STEAM AT HIGH TEMPERATURE.
Quarterly progress rept. no. 10, 1 Oct-31 Dec 64.
29 Jan 65, 82p
Contract 089-62-7

Unclassified report

Descriptors: (*Steel, Corrosion), (*Corrosion, Steel), Water, Steam.

GAT-T1219 (Rev 1) Field 11C, 14B, 7B
CFSTI Prices: HC$1.00 MF$0.50

Goodyear Atomic Corp., Piketon, Ohio.
SOME ULTRA-MICROTOMY STUDIES OF NICKEL FLUORIDE FILMS ON NICKEL FOIL,
by F. C. Steinbach and K. E. Beu. 2 Oct 64, 14p
CONF-668-4
Contract AT-(33-2)-1

Unclassified report

Descriptors: (*Nickel, Foils), (*Fluorides, Films), Nickel compounds.

KAPL-3066 Field 11F, 13H
CFSTI Prices: HC$2.00 MF$0.50

Knolls Atomic Power Lab., Schenectady, N. Y.
INVESTIGATION OF THE FORMATION OF LARGE ALPHA GRAINS IN SIMULATED WELD STRUCTURES OF ZIRCALOY-4,
by A. E. Bibb, A. P. Beard, and J. R. Fascia.
28 Dec 64, 29p
Contract W-31-109-eng-52

Unclassified report

Descriptors: (*Zirconium alloys, Microstructure), Welds.

LA-2838 Field 11F
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
PROCESSING OF PLUTONIUM BY ION EXCHANGE. III. THE CALCULATION OF FIXED-BED COLUMN PERFORMANCE,
by D. B. James and R. S. Copper. Jul 64, 15p
Contract W-7405-eng-36

Unclassified report

Descriptors: (*Plutonium, Processing), (*Ion exchange, Plutonium).

MCW-1491 Field 11F, 20B
CFSTI Prices: HC$2.00 MF$0.50

Mallinckrodt Chemical Works, Weldon Spring, Md. Uranium Div.
EFFECT OF ALLOY ADDITIONS ON THE QUENCH-INDUCED TEXTURE OF ALPHA-URANIUM,
by K. R. Riggs, and N. F. Neumann. 16 Apr 65, 44p
Contract W-14-108-eng-8

Unclassified report

Descriptors: (*Uranium alloys, Crystallography), (*Crystallography, Uranium alloys).

NAA-SR-11047 Field 11F
CFSTI Prices: HC$2.00 MF$0.50

Atomics International, Canoga Park, Calif.
SOME HIGH TEMPERATURE MECHANICAL PROPERTIES OF ZIRCALOY-2, TYPE 304 STAINLESS STEEL, AND AM-350 STAINLESS STEEL,
by D. H. Stone. 15 Jun 65, 28p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Stainless steel, Mechanical properties), (*Zirconium alloys, Mechanical properties), High temperature research, Tin alloys.

NAA-SR-MEMO-9761 Field 11B, 18J
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
PREPARATION OF CERAMOGRAPHIC SECTIONS OF BERYLLIUM OXIDE.
by V. C. Davis and R. L. Echelbarger. 29 Jun 64, 13p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Beryllium compounds, Oxides), (*Visual inspection, Ceramic materials), Processing.

ORNL-3603 Field 11F
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
NIOBIUM - 1 PERCENT ZIRCONIUM, NATURAL-CIRCULATION, BOILING-POTASSIUM CORROSION LOOP TEST,
by D. H. Jensen and E. E. Hoffman. May 64, 55p
Contract W-7405-eng-2

Unclassified report

Descriptors: (*Niobium alloys, Corrosion), (*Zirconium alloys, Corrosion).

ORNL-P-1165 Field 11F, 14B
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
COMPARISON OF POLE FIGURE DATA OBTAINED BY X-RAY DIFFRACTION AND MICROHARDNESS MEASUREMENTS ON ZIRCALOY-2,
by P. L. Rittenhouse and M. L. Picklesimer. 1964, 20p
CONF-650210-3
Contract W-7405-eng-2

Unclassified report

Presented at the Application of X-ray Diffraction In The Atomic Energy Field Meeting, Richland, Wash.

Descriptors: (*Zirconium alloys, Crystal structure), (*Crystal structure, Test methods).

ORNL-TM-1063 Field 11F
CFSTI Prices: HC$4.00 MF$0.75

Oak Ridge National Lab., Tenn.
MAGNETIC STRUCTURE PROPERTIES OF SOME HEAVY RARE EARTH ALLOYS.
Doctoral thesis,
by Harry Ray Child. 23 Feb 65, 106p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Rare earth elements, Alloys), (*Alloys, Magnetic properties).

Patent 3,197,334 Field 11F, 9A, 9B

METHOD OF COATING A SUBSTRATE WITH MAGNETIC FERRITE FILM.
Patent assigned to Army,
by William L. Wade, Jr. 27 Jul 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Ferromagnetic materials, Metal films), (*Metal films, Preparation), Ferrites, Spinels, Coatings, Iron compounds, Nickel compounds, Zinc compounds, Cobalt compounds, Nitrates, Alcohols, Thin films-(Storage devices), Microwave equipment, Patents.

The magnetic ferrite film may be used in computer memories, logic circuits and microwave devices. The method involves the dissolving of ferric nitrate and one or more nitrates of the metals of the group of magnesium, nickel, aluminum, zinc, and cobalt in alcohol at room temperature; immersing the surface of a substrate in the solution; preliminary firing the coated substrate at 400C to 700C in a furnace; and successively cooling to room temperature between coats. After weighing on a balance to determine exact amounts of material deposited, the coated substrate is heated to 1000C to 1100C in a furnace for one to five hours to align the oxides formed to the spinel structure of the ferrite.

Patent 3,198,734 Field 11H

LUBRICANTS COMPRISING POLYPHENYL ETHERS AND MIXED METAL SALTS OF FATTY ACIDS.
Patent assigned to Esso Research and Engineering Co.,
by Arnold J. Morway. 3 Aug 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Heat-resistant materials, Lubricants), (*Lubricants, Preparation), Oils, Greases, Fatty acids, Salts, Alkaline earth compounds, Organic solvents, Phenols, Ethers, Polymers, Acetates, Calcium compounds, Oxides, Patents.

Alkaline earth metal salts of a C2 to C4 fatty acid and a C7 to C30 fatty acid in a polyphenyl ether base oil are used as high temperature lubricants. The mixed salt lubricants have good anti-wear and load-carrying ability and are used in aircraft, rocket engines, steel making facilities, etc. The lubricating composition includes from 4 to 20 moles of C2 to C4 fatty acid per mole of C7 to C30 fatty acid and from 60 to 95 weight percent of polyphenyl ether. Specifically claimed is a composition prepared from acetic acid, lime, a mono-unsaturated C18 acid, and a pentaphenyl ether.

Patent 3,198,735 Field 11H, 13I

SOLID LUBRICANT COMPOSITION AND METHOD FOR LUBRICATING ANTI-FRICTION BEARING STRUCTURES.
by Edward R. Lamson and Martin J. Devine.
3 Aug 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Lubricants, Binders), (*Antifriction bearings, Lubrication), Solids, Films, Sodium compounds, Borates, Phosphates, Patents.

Sodium metaborate and sodium hexametaphosphate are used as bonding agents for solid film lubricants in anti-friction bearings. The lubricant contains from 12 to 40 percent sodium metaborate and sodium hexametaphosphate and from 60 to 88 percent of a solid lubricant such as graphite, lead oxide, barium oxide, zinc sulphate, nickel fluoride and barium sulfide. An anti-friction bearing using this lubricant can operate for long periods under extreme variations in temperature and pressure.

Patent 3,198,736 Field 11H

LUBRICATING COMPOSITION.
Patent assigned to Shell Oil Co.,
by Bennett M. Henderson. 3 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Lubricant additives, Polymers), (*Polymers, Lubricant additives), Pyridines, Vinyl plastics, Organic nitrogen compounds, Acrylic resins, Phosphorus compounds, Sulfides, Terpenes, Patents.

From 1 to 15 percent of an oil-soluble copolymer of C-vinyl pyridine and a mixture of dissimilar C12-18 alkyl acrylates are used as detergent additives in mineral lubricating oil compositions. Lubricating oils containing these detergents are wear and sludge resistant and have improved extreme pressure properties such as those encountered in heavy duty engines. The lubricating oil also contains from 0.5 to 5 percent of a reaction product of phosphorus sulfide and terpene. A preferred composition contains 2-methyl-5-vinyl pyridine and a mixture of lauryl and stearyl methacrylates, the ratio of the vinyl pyridine to the methacrylate mixture being from 1:1 to 1:20.

Patent 3,198,737 Field 11H

LUBRICATING COMPOSITIONS AND ADDITIVES THEREFOR.
Patent assigned to Shell Oil Co.,
by George M. Calhoun. 3 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Lubricants, Preparation), (*Lubricant additives, Sulfoxides), (*Sulfoxides, Lubricant additives), Pressure, Ethers, Fatty acid esters, Polymers, Stearates, Glycols, Patents.

A disulfoxy modified polyether-ester composition imparts extreme pressure characteristics to engine and gear oils. Long chain fatty acids of at least 18 carbon atoms are esterified with a polyoxyalkylene diol such as trimethylene glycol. The ester is reacted with a mercapto aliphatic carboxylic acid, such as mercaptoacetic acid, and this composition is treated with hydrogen peroxide to form the final sulfoxide product. A mineral or synthetic lubricating oil contains from 1 to 5 percent by weight of the additive. One composition is dicarboxymethyl-sulfoxystearate diester of diethylene glycol.

Patent 3,198,738 Field 11H

LUBRICATING COMPOSITIONS AND ADDITIVES THEREFOR.
Patent assigned to Shell Oil Co.,
by Adriaan H. Wagenaar and Maurits Krukziener.
3 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Lubricants, Preparation), (*Lubricant additives, Oximes), (*Oximes, Lubricant additives), Oils, Polymers, Ketones, Aldehydes, Acrylic resins, Copolymerization, Catalysts, Peroxides, Cleaning compounds, Wear resistance, Amines, Patents.

An oximino-containing polymer additive is utilized in gasoline, jet fuel, hydraulic and quenching fluids, and mineral lubricating oils as a corrosion inhibitor, in amounts ranging from 0.1 to 10 weight percent. A compound having carbonyl groups is formed by reacting acrolein, methacrolein, or methyl isopropenyl ketone with an aliphatic ester of methacrylic, maleic, or fumaric acid, in the presence of benzoyl peroxide or azo-bis-isobutyronitrile. The carbonyl compound is further reacted with the hydrochloric acid salt of hydroxyl amine to convert the carbonyl groups to oximino groups. The polymer has at least 150 carbon atoms in the backbone chain and a molecular weight ranging from 50,000 to 500,000. It is a suitable inhibitor for oils having high temperature applications. 5 claims.

Patent 3,198,739 Field 11H

LUBRICANTS AND POLYMERIC ADDITIVES THEREFOR.
Patent assigned to Shell Oil Co.,
by Harry F. Richards, Stephen A. Herbert, Jr., and
Robert J. Moore. 3 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Lubricants, Preparation), (*Lubricant additives, Polymers), (*Acrylic resins, Lubricant additives), Fatty acid esters, Polyester plastics, Glycols, Copolymerization, Cleaning compounds, Mineral oils, Patents.

A polyhydroxy-carboxylate detergent copolymer with increased anti-sludging properties for internal combustion engine lubricating oils is the polymerization product of acrylic or alkacrylic acids and dihydroxy alkanes. Alkyl methacrylates having from 12 to 20 carbon atoms are combined with an ester of methacrylic acid and 1,5-pentanediol at temperatures from 50 to 150 degrees C. in the presence of a peroxide catalyst. The detergent constitutes from 0.01 to 5 percent by weight of a paraffinic, anphthenic, or asphaltic base oil. The lubricants also find utility as transformer, turbine, and other industrial oils.

Patent 3,200,072 Field 11H

EXTREME PRESSURE LUBRICANT CONTAINING ALKYD RESINS DERIVED FROM COMPLEX ACIDS.
Patent assigned to The Pure Oil Co.,
by Louis A. Joo and John B. Braunwarth. 10 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Lubricant additives, Polyester plastics), (*Polyester plastics, Lubricant additives), Fatty acid esters, Salts, Alcohols, Glycerols, Organic sulfur compounds, Organic phosphorus compounds, Cobalt compounds, Sodium compounds, Polycyclic compounds, Pressure, Patents.

An extreme pressure additive for lubricants for automotive vehicle differentials and transmissions as well as industrial machinery combines sulfurized-phosphorized sperm or lard oil with an alkyd resin and a minor portion of the naphthenate salt of cobalt, iron, copper, or zinc. The alkyd resin is the reaction product of a mixed complex of carboxylic acids prepared from phenol extracts obtained in the phenol refining of mineral oil, and glycerol. The phenolic extracts are treated with sodium, carbonated to produce a sodium salt of a carboxylic acid, and then acidified. A mineral lubricating oil contains from 2 to 20 percent by weight of the fatty oil, from 0.3 to 3 percent of the oil-soluble alkyd resin, and from 0.0001 to 0.001 percent of cobalt naphthenate. The resin and naphthenate replace dibenzyl disulfide, a more expensive additive.

Patent 3,200,073 Field 11H

AGENTS TO IMPROVE YIELDS OF HYDROXY STEARATE GREASES.
Patent assigned to California Research Corp.,
by Dean W. Criddle. 10 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Greases, Preparation), (*Lubricant additives, Carboxylic acids), (*Sebacic acid, Lubricant additives), (*Stearates, Viscosity), Soaps, Lithium compounds, Calcium compounds, Patents.

Greases containing lithium or calcium 12-hydroxy stearate thickeners are obtained in greater yield and with an increase in dropping point by incorporating a minor amount of azelaic or sebacic acid. From 0.5 to 4 percent by weight of the acid is added to mineral or synthetic greases and lubricating compositions used in steel mill machinery, in paper mill equipment, in nuclear reactors, and in military amphibious vehicles and aircraft. The acids are blended into the oil base at a temperature of 250 degrees F.

Patent 3,200,074 Field 11H

LUBRICATING COMPOSITIONS CONTAINING BORATE ESTER-AMINE COMPLEXES.
Patent assigned to Texaco Inc.,
by Edwin C. Knowles and Edward L. Kay. 10 Aug 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Lubricant additives, Complex compounds), (*Borates, Lubricant additives), (*Esters, Lubricant additives), (*Amines, Lubricant additives), Halogenated hydrocarbons, Aromatic compounds, Organoboranes, Antioxidants, Pressure, Patents.

A hydrolytically stable extreme pressure and anticorrosive agent for automotive transmission oils is a complex formed by an aliphatic monoamine having from 8 to 26 carbon atoms per molecule and a halogen-containing alkyl, aryl, or alkaryl borate. The borate ester-amine compounds constitute from 0.5 to 5 percent by weight of the lubricating composition. One compound is prepared by reacting tri(nonylphenyl)borate with a tertiary alkyl primary amine. Mineral oils having viscosities ranging from 40 to 50 SUS at 210 degrees F. are the base oils for the additive.

PB-168 315 Field 11L, 7C
CFSTI Prices: HC$1.00 MF$0.50

Forest Products Laboratory, Madison, Wis.
TREATMENT OF KRAFT PAPERBOARDS AND A KRAFT PULP WITH ACRYLONITRILE.
Research note,
by R. A. Horn and F. A. Simmonds. Mar 65, 16p
Rept. no. FPL-083
Unclassified report

Prepared in cooperation with Wisconsin Univ., Madison.

Descriptors: (*Acrylonitrile polymers, Composition board), (*Composition board, Acrylonitrile polymers), (*Paper, Acrylonitrile polymers), Paper industry, Scientific research, Compressive properties, Bonding, Physical properties.

Acrylonitrile was reacted with unbleached southern pine kraft linerboard and bleached southern pine kraft cardstock to determine the effect of this treatment on compressive strength and dimensional stability. A sweetgum kraft pulp was treated similarly before and after bleaching and the papermaking qualities of the treated pulps were evaluated. (Author)

SC-DR-64-1782 Field 11I
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
DIFFERENTIAL THERMAL ANALYSIS OF FLEXIBLE POLYURETHANE FOAMS. I. TRANSITIONS AND THEIR EFFECT ON STRESS-STRAIN PROPERTIES,
by Peter B. Rand. Jan 65, 22p
Contract AT(29-1)-789
Unclassified report

Descriptors: (*Isocyanate plastics, Mechanical properties), (*Expanded plastics, Transition temperature).

TID-21599 Field 11F
CFSTI Prices: HC$3.00 MF$0.75

Illinois Univ., Urbana. Dept. of Theoretical and Applied Mechanics.
YIELD BEHAVIOR OF NIOBIUM SINGLE CRYSTALS,
by D. C. Huffaker. Sep 64, 67p TAM-268
Contract AT(11-1)-1046
Unclassified report

Descriptors: (*Niobium, Single crystals), (*Single crystals, Niobium).

UCRL-7562 Field 11F, 13H
CFSTI Prices: HC$2.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
RECENT ADVANCES IN VACUUM METALLURGY IN THE UNITED STATES,
by R. F. Bunshah. 11 Nov 63, 44p
CONF-631107-1
Contract W-7405-eng-48
Unclassified report

Presented at the National Vacuum Symposium no. 4 held at Kyoto, Japan, 21-22 Nov 63.

Descriptors: (*Refining(Metallurgy), Vacuum apparatus), (*Vacuum apparatus, Refining(Metallurgy).

UCRL-7767 Field 11F
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
STRESS-CRACKING IN THE URANIUM-10 W/O MOLYBDENUM ALLOY,
by C. A. W. Peterson and R. R. Vandervoort.
13 Mar 64, 14p CONF-640404-1
Contract W-7405-eng-48
Unclassified report

Presented at the Joint working group weapons research development meeting, Aldermaston, Reading, Berkshire (England).

Descriptors: (*Uranium alloys, Mechanical properties), (*Molybdenum alloys, Mechanical properties).

UCRL-7938 Field 11B
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
OXYGEN-18 DIFFUSION IN SURFACE DEFECTS ON MGO AS REVEALED BY PROTON ACTIVATION,
by J. Birch Holt and Ralph H. Condit. 1 Feb 65, 22p
CONF-641116-2
Contract W-7405-eng-48
Unclassified report

Presented at the Conference on the Role of Grain Boundaries and Surfaces in Ceramics, Raleigh, N. C.

Descriptors: (*Ceramic materials, Surface properties), (*Surface properties, Ceramic materials), Magnesium compounds, Oxides, Excitation, Analysis.

UCRL-11569 Field 11F
CFSTI Prices: HC$3.00 MF$0.75

Lawrence Radiation Lab., Univ. of California, Berkeley.
ELEVATED TEMPERATURE STRAIN AGING OF CONVENTIONAL AND AUSFORM STEELS.
Doctoral thesis,
by Virendra Singh Goel. Jan 65, 75p
Contract W-7405-eng-48
Unclassified report

Descriptors: (*Steel, Aging(Materials), (*Strain-(Mechanics), Steel).

UCRL-11897 Field 11F
CFSTI Prices: HC$2.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Berkeley.
CLIMB OF IMPERFECT DISLOCATIONS IN ALUMINUM.
Master's thesis,
by Nathapet Durai Raghavan. Jan 65, 34p
Contract W-7405-eng-48
Unclassified report

Descriptors: (*Aluminum, Metallography), (*Metallography, Aluminum), Crystal lattice defects.

UCRL-11928 Field 11F, 7D
CFSTI Prices: HC$3.00 MF$0.75

Lawrence Radiation Lab., Univ. of California, Berkeley.
DETERMINATION OF THE ORDERING IN THE INTERMETALLIC COMPOUND AG2AL BY MEANS OF X-RAYS.
Doctoral thesis,
by Joachim P. Nuemann. 28 Jan 65, 63p
Contract W-7405-eng-48 Unclassified report

Descriptors: (*Intermetallic compounds, Molecular structure), (*X-ray diffraction analysis, Intermetallic compounds).

UCRL-14128 Field 11F
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
THE PURIFICATION OF PLUTONIUM BY ELECTROLYSIS OF THE SOLID METAL,
by W. Z. Wade and T. Wolf. 15 Apr 65, 12p
Contract W-7405-eng-48
Unclassified report

Descriptors: (*Plutonium, Purification), (*Electrolysis, Plutonium).

12. Mathematical Sciences

ANL-6988 Field 12A, 9B
CFSTI Prices: HC$2.00 MF$0.50

Argonne National Lab., Ill.
SINGULAR INTEGRALS AND SINGULAR INTEGRAL EQUATIONS WITH A CAUCHY KERNEL AND THE METHOD OF SYMMETRIC PAIRING,
by Erwin H. Bareiss and Charles P. Neuman. Jan 65, 44p
Contract W-31-109-eng-38
Unclassified report

Descriptors: (*Integral equations, Transformations-(Mathematics)), (*Programming(Computers), Numerical methods and procedures).

BNL-7850 Field 12A, 20M
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
A PRIORI ESTIMATE FOR CONTINUATION OF THE SOLUTION OF THE HEAT EQUATION IN THE SPACE VARIABLE,
by J. R. Cannon. 1962, 14p
Contract AT(30-2)-GEN-16
Unclassified report

Descriptors: (*Partial differential equations, Thermodynamics), (*Boundary value problems, Functions).

BNL-7851 Field 12A, 20M
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
A CAUCHY PROBLEM FOR THE HEAT EQUATION.
by J. R. Cannon. 1962, 19p
Contract AT(30-2)-GEN-16
Unclassified report

Descriptors: (*Heat transfer, Partial differential equations), (*Partial differential equations, Heat transfer).

CONF-650501-4 Field 12A
CFSTI Prices: HC$1.00 MF$0.50

Knolls Atomic Power Lab., Schenectady, N. Y.

VARIATIONAL SYNTHESIS WITH DISCONTINUOUS TRIAL FUNCTIONS,
by E. L. Wachspress and M. Becker. Feb 65, 22p
Contract W-31-109-eng-52

Unclassified report

Published in the Proceedings of the International Conference on Application of Computing Methods to Reactor Problems, Argonne National Lab, Ill. May 65.

Descriptors: (*Difference equations, Functions), (*Simultaneous equations, Functional analysis).

IS-1128 Field 12A, 9B
CFSTI Prices: HC$2.00 MF$0.50

Ames Lab., Iowa State Univ. of Science and Tech.
GENERATION AND TESTING OF RANDOM-NUMBER SEQUENCES,
by Frank S. Carlsen. Mar 65, 37p
Contract W-7405-eng-82

Unclassified report

Descriptors: (*Sequences, Computers), (*Computers, Sequences).

KAPL-M-6416 Field 12A, 9B
CFSTI Prices: HC$1.00 MF$0.50

Knolls Atomic Power Lab., Schenectady, N. Y.
MATHEMATICAL PROGRAMS AVAILABLE ON THE PHILCO-2000 COMPUTER. PART 2. CURVE PLOTTING,
by G. L. Lechliter, A. L. Liedal, and J. R. Schmid.
16 Oct 64, 21p KAPL-M-EC-40
Contract W-31-109-eng-52

Unclassified report

Descriptors: (*Mathematical programming, Graphics), (*Graphics, Mathematical programming), (*Programming(Computers), Graphics).

KAPL-M-6436 Field 12A, 9B
CFSTI Prices: HC$1.00 MF$0.50

Knolls Atomic Power Lab., Schenectady, N. Y.
STAT-1:-AN INTERPRETIVE PROGRAM FOR STATISTICAL CALCULATIONS,
by R. W. Guillette. 21 Dec 64, 17p
KAPL-M-EC-46 Unclassified report
Contract W-31-109-ENG-52

Descriptors: (*Statistical analysis, Programming-(Computers)), (*Programming(Computers), Statistical analysis).

NAA-SR-MEMO-9729 Field 12A
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
HARMONIC ANALYSIS FOURIER SERIES CURVE FIT,
by Elizabeth Lee Bramblett. Mar 64, 22p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Harmonic analysis, Curve fitting), (*Curve fitting, Fourier analysis).

NYO-1480-11 Field 12A, 9B
CFSTI Prices: HC$2.00 MF$0.50

AEC Computing and Applied Mathematics Center, New York Univ., N. Y.
SOME EXPERIMENTS IN ALGEBRAIC MANIPULATION BY COMPUTER,
by Arnold Lapidus and Max Goldstenn. 1 Oct 64, 34p
Contract AT(30-1)-1480

Unclassified report

Descriptors: (*Algebra, Programming(Computers)), (*Programming(Computers), Algebra).

ORNL-3742 Field 12A
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
A GENERALIZED ONE-CONSTRAINT LAGRANGE MULTIPLIER NUMERICAL FORMULATION,
by F. H. S. Clark and F. B. K. Kam. Mar 65, 40p
N65-19735
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Partial differential equations, Numerical analysis), (*Numerical analysis, Partial differential equations).

ORNL-3743 Field 12A
CFSTI Prices: HC$4.00 MF$0.75

Oak Ridge National Lab., Tenn.
UTILIZATION OF A PRIORI INFORMATION BY MEANS OF MATHEMATICAL PROGRAMMING IN THE STATISTICAL INTERPRETATION OF MEASURED DISTRIBUTIONS.
Doctoral thesis,
by W. R. Burrus. Jun 65, 114p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Mathematical programming, Statistical distributions), (*Statistical distributions, Mathematical programming).

ORNL-3766 Field 12A, 12B, 9B
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
MATHEMATICS DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING DECEMBER 31, 1964,
by A. S. Householder and H. P. Carter. Mar 65, 89p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Mathematics, Reviews), (*Computers, Reviews).

PB-168 139 Field 12A
CFSTI Prices: HC$3.00 MF$0.75

Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
CALCULATION OF PSI, PHI AND OF THEIR DERIVATIVES (Calcul de psi, phi et de Leurs Derivees),
by Yves Dandeu, Lucienne Gautier, Jean Guillermin, Ginette Olivie, and Franck Roche. Jun 65, 83p
Rept. no. CEA-R-2824

Unclassified report

Text in French with attached summary in English.

Descriptors: (*Integrals, Numerical methods and procedures), Functions, Series, Polynomials.

UCRL-7779 Field 12A, 9B
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
A NUMERICAL METHOD FOR GENERATING THE COEFFICIENTS OF F EQUAL (X + X 2 + ... + X M)N,
by Grover M. Taylor. 24 Mar 64, 5p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Numerical methods and procedures, Programming(Computers).

13. Mechanical, Industrial, Civil, and Marine Engineering

AD-448 495 Field 13J, 5A
CFSTI Price: HC$3.00

Pennsylvania Military Coll., Chester.
STRUCTURAL FOUNDATION DAMPING PROGRAM, Summary rept.,
by R. A. DiTaranto. 28 Aug 64, 52p
Contract N161 25672
MEL 217-64

Unclassified report

Descriptors: (*Laminates, Ship structural components), (*Ship noise, Reduction), (*Acoustics, Ship structural components), Damping, Theory, Equations, Foundations-(Structures), Structural properties, Viscoelasticity, Beams(Structural), Differential equations, Materials, Sound transmission, Naval research, Underwater sound.

An investigation was made of the use of laminated materials for use as foundation structures. This material is composed of alternate steel and viscoelastic layers, and is contemplated for its simultaneous use as a load carrying member and a dissipator of time-varying energy passing through it or impinging upon it from the surrounding air.

ANL-6924 Field 13H
CFSTI Prices: HC$2.00 MF$0.50

Argonne National Lab., Ill.
THE NONDESTRUCTIVE TESTING OF BRAZED JOINTS,
by Akira Kanno. Nov 64, 30p
Contract W-31-109-eng-38

Unclassified report

Descriptors: (*Metal joints, Non-destructive testing), (*Non-destructive testing, Metal joints).

ANL-6928 Field 13H, 11F
CFSTI Prices: HC$3.00 MF$0.75

Argonne National Lab., Ill.
CONSOLIDATION AND FABRICATION TECHNIQUES FOR VANADIUM-20 W/O TITANIUM (TV-20),
by W. R. Burt, Jr., W. C. Kramer, R. D. McGowan, F. J. Karasek, and R. M. Mayfield. Feb 65, 83p
Contract W-31-109-eng-38

Unclassified report

Descriptors: (*Vanadium alloys, Titanium alloys), (*Mechanical working, Vanadium alloys).

BDX-613-42 Field 13H, 11D, 11I
CFSTI Prices: HC$1.00 MF$0.50

Bendix Corp., Kansas City, Mo.
BONDING FLUOROHALOCARBONS TO COPPER FOR ELECTRICAL APPLICATIONS,
by Lloyd C. Jackson. Nov 63, 10p
Contract AT(29-1)-613

Unclassified report

Presented to Plating magazine, 25 Aug 64.

Descriptors: (*Halocarbon plastics, Electric insulation), (*Bonding, Halocarbon plastics), Copper.

CONF-650409-1 Field 13A
CFSTI Prices: HC$2.00 MF$0.50

Knolls Atomic Power Lab., Schenectady, N. Y.
AN INTRODUCTION TO THE ASME UNFIRED PRESSURE VESSEL CODE,
by C. V. Moore. 15 Mar 65, 44p
Contract W-31-109-ENG-52

Unclassified report

Presented at the Pressure Vessel Symposium, Asme, Idaho Falls, Idaho, 15 Apr 65.

Descriptors: (*Pressure vessels, Standards).

DP-419 Field 13H, 13K
CFSTI Prices: HC$2.00 MF$0.50

Aeroprojects, Inc., West Chester, Pa.
ULTRASONIC CLEANING OF LONG ALUMINUM-CLAD TUBES,
by John G. Thomas, Nicholas Maropis, J. Lloyd Straughn and Florence R. Meyer. Nov 59, 34p
Contract AT(07-2)-1

Unclassified report

Descriptors: (*Cleaning, Pipes), (*Ultrasonic radiation, Cleaning), Aluminum, Cladding.

K-L-6018 Field 13H
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge Gaseous Diffusion Plant, Tenn.
FLUXLESS INTERNAL SOLDER SEAL FOR METAL TUBING,
by R. H. Stevens. 4 Feb 65, 6p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Sealing compounds, Soldering), (*Pipes, Soldering).

K-L-6020 Field 13H, 11F
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge Gaseous Diffusion Plant, Tenn.
PREPARATION OF REFRACTORY METAL POWDERS WITH UNUSUAL PROPERTIES,
by S. H. Smiley, D. C. Brater, and H. L. Kaufman. 26 Jan 65, 25p CONF-650203-1
Contract W-7405-eng-26

Unclassified report

Presented at the Annual meeting of the American Inst. of Mining, Metallurgical and Petroleum Engineers (94th) Chicago, Ill. 14-18 Feb 65.

Descriptors: (*Refractory metals, Powder metals), (*Powder metals, Preparation).

NAA-SR-8541 Field 13H
CFSTI Prices: HC$0.75 MF$0.50

Atomic International, Canoga, Park, Calif.
A DEVICE FOR INTERNAL T. I. G. ARC WELDING OF TUBE TO TUBE-SHEET JOINTS,
by G. Kazlauskas. 15 Mar 65, 46p
Contract AT(11-1)-GEN-8
Unclassified report

Descriptors: (*Arc welding, Pipes), (*Pipes, Arc welding).

Patent 3,189,990 Field 13H

METHOD OF PREPARING SMALL DIAMETER TUBES AND THE LIKE.
Patent assigned to Commerce,
by William H. Metzger, Jr. 22 Jun 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Material forming, Capillary tubes), (*Capillary tubes, Manufacturing methods), Electroforming, Chemical milling, Nitric acid, Gold, Copper, Patents.

The method is for removing long, thin cores from electroforms and the like to prepare articles having extended, capillary passageways. The article may be made of gold and the core may be copper. The article is immersed in a vessel containing nitric acid. The vessel is sealed and the acid heated to about 150 degrees C. for 72 hours. The nitric acid eats out the copper core.

PB-167 991 Field 13J, 13F
CFSTI Prices: HC$5.00 MF$1.25

California Univ., Los Angeles. Dept. of Engineering.
PROCEEDINGS OF THE MARITIME CARGO SYMPOSIUM, A TWO-DAY CONFERENCE SEPTEMBER 17-18 1964 AT THE PORT OF LONG BEACH ADMINISTRATION BUILDING, LONG BEACH, CALIFORNIA.
1964, 198p
Unclassified report

Prepared in cooperation with Maritime Administration, Port of Long Beach, Calif.

Descriptors: (*Shipping(Marine), Symposium), (*Cargo, Shipping(Marine)), Handling, Cargo ships, Piers, Transportation, Cargo vehicles.

The Proceedings of the Maritime Cargo Symposium contain the papers presented during the sessions as well as the introductory address by Nicholas Johnson, Maritime Administrator, which set the theme for the Symposium. The Symposium was a working-type conference of leaders associated with maritime cargo. The objectives were to develop insights regarding the following questions: Is there a maritime cargo problem. What is its nature if it exists. Are there any practicable current solutions to the problem. What are the benefits to be derived from these solutions and who are the recipients of these benefits. (Author)

PB-168 116 Field 13H, 7A, 8G
CFSTI Prices: HC$4.00 MF$1.00

West Virginia Univ., Morgantown. Coal Research Bureau.
COAL-ASSOCIATED MINERALS OF THE UNITED STATES. PART 7. USES, SPECIFICATIONS AND PROCESSES RELATED TO COAL-ASSOCIATED MINERALS.
Coal research and development rept.,
by O. B. Bucklen, C. F. Cockrell, B. A. Donahue, J. W. Leonard, and C. R. McFadden. 1965, 137p
Rept. no. CRDR-8, pt. 7
Contract 14 01 0001 269 Unclassified report
See also PB-168 115.

Descriptors: (*Minerals, Material separation), (*Chemical industry, Mineral products), (*Coal, Economic geology), (*Economic geology, Minerals), Refractory materials, Ceramic materials, Clay, Shale, Limestone, Sandstone, Industrial production, Specifications, Chemical engineering.

This volume brings together under one cover most of the known, proposed and new uses, specifications and processes which are applicable to minerals that are in or near coal seams. It is intended to serve as a technical instrument to be used with the six area feasibility volumes (Parts 1-6) which identify, for different coal-bearing geographic areas of the United States, the geologic locations, quality and market possibilities for coal-associated minerals. In this volume, the technology of coal-associated minerals is divided into six sections (7-A to 7-F) according to commodity (clay, limestone, sandstone, etc.) and one section (7-G) according to function. The text of each individual section is preceded by a secondary table of contents and is followed by appropriate references, figures and tables resulting in a self-contained unit. The general category and extent of coverage for all the sections can be found in the primary table of contents at the front of this volume. An index at the end of the volume will provide for the expeditious location of specialized technical information. (Author)

PB-168 260 Field 13F, 13B, 13M
CFSTI Prices: HC$3.00 MF$0.50

Parsons, Brinckerhoff, Quade and Douglas, New York.
HIGH LEVEL AND LOW LEVEL SUBWAYS: PRELIMINARY ENGINEERING STUDY.
27 Nov 61, 52p Unclassified report
Research supported by National Capital Transportation Agency, Washington, D. C.

Descriptors: (*Railroads, Underground structures), (*Underground structures, Railroads), (*Civil engineering, Underground structures), (*Transportation, District of Columbia), Engineering geology, Construction, Costs, Feasibility studies, Urban planning, Urban areas.

Preliminary engineering analyses of high level and low level subway construction in the downtown area of Washington, D. C. are presented. The purpose of these analyses is to provide the National Capital Transportation Agency with information on the design, construction procedures, and estimated construction costs of a route whose engineering and construction problems are considered typical of the conditions which would be encountered on routes ultimately to be chosen by the Agency for its Transit Development Program. The route selected by the Agency as being representative of these conditions is 7,800 feet long and starts at the intersection of Massachusetts Avenue and G Street, extends westward along G street to 15th Street, turns into Pennsylvania Avenue, and terminates at the intersection of Jackson Place and Pennsylvania Avenue. The high level subway is defined as a two-track structure which is located vertically as near the surface of the street as possible with just enough earth cover to permit the installation of utilities. The low level subway is defined as a two-track structure which is located vertically as near the surface of the street as possible while permitting the installation of a mezzanine at the station.

PB-168 262 Field 13F, 15B, 13B, 13M
CFSTI Prices: HC$2.00 MF$0.50

Parsons, Brinckerhoff, Quade and Douglas, New York.
PROPOSED SUBWAYS AS DUAL PURPOSE FALLOUT SHELTERS: PRELIMINARY STUDY OF INCREMENTAL COSTS.
Unclassified report
13 Sep 62, 48p
Research supported by National Capital Transportation Agency, Washington, D. C.

Descriptors: (*Railroads, Underground structures), (*Underground structures, Shelters), (*Shelters, Underground structures), Civil engineering, Civil defense systems, Radioactive fallout, Health physics, Costs, Feasibility studies, District of Columbia, Urban planning, Urban areas.

The purpose of this preliminary engineering study is to determine the incremental costs of providing community fallout shelters, either in the initial construction, or in later construction, of a proposed subway system in the Washington, D. C. area. The proposed subway system is in a preliminary planning stage, with criteria as to subway section, stations, and facilities not yet determined. The incremental costs developed in this study, therefore, are based on the information contained in a previous report (PB-168 260) prepared by this firm for the NCTA. In the present study, incremental costs are developed that may be incurred under a number of alternatives, both as to subway arrangement and methods of construction; i. e., a high-level or low-level subway arrangement and cut-and-cover or tunnelling methods of construction. The incremental costs that would be incurred if provision for fallout shelters was included in the initial construction, as compared to such costs if the facilities were added subsequently, have also been developed. In addition to providing the necessary features for fallout protection, the incremental costs of providing facilities to sustain shelter occupants for a minimum of 14 days have been prepared. By directive, the additional construction necessary to create a blast-resistant shelter has not been studied, but a measure of the blast effectiveness of the dual-purpose subway shelters has been made.

PB-168 291 Field 13F, 13B, 13M, 8G
CFSTI Prices: HC$3.00 MF$1.00

Dames and Moore, New York.
PROPOSED RAPID TRANSIT SYSTEM, WASHINGTON, D. C., FOR THE NATIONAL CAPITAL TRANSPORTATION AGENCY.
Rept., phase 1,
by Gardner M. Reynolds and James V. Toto. 6 Aug 62, 81p
Unclassified report

Descriptors: (*Railroads, Underground structures), (*Underground structures, Railroads), (*Civil engineering, Underground structures), (*Transportation, District of Columbia), Engineering geology, Soils, Structural geology, Well logging, Maps, Feasibility studies, Urban planning, Urban areas.

This report presents the results of a study concerning the subsurface conditions in the Washington, D. C. area for a proposed Rapid Transit System. Originally, three alternate interconnecting routes for the proposed Rapid Transit System were under study and it was decided that foundation investigations would be required along these routes to develop preliminary design plans. Prior to undertaking extensive foundation investigations, it was deemed feasible to make a search for existing subsurface data along the proposed routes, analyze these data and use them as a basis for planning the more extensive foundation investigations.

PB-168 292 Field 13F, 13B, 13M, 8G
CFSTI Prices: HC$2.00 MF$0.50

Dames and Moore, New York.
FOUNDATION INVESTIGATION, PROPOSED RAPID TRANSIT SYSTEM, WASHINGTON, D. C., FOR THE NATIONAL CAPITAL TRANSPORTATION AGENCY.
Rept., phase 2, priorities 1 and 2,
by Gardener M. Reynolds. 10 Sep 62, 47p
Unclassified report

See also PB-168 291.

Descriptors: (*Railroads, Underground structures), (*Underground structures, Railroads), (*Civil engineering, Underground structures), (*Transportation, District of Columbia), Foundations(Structures), Engineering geology, Soils, Structural geology, Well logging, Maps, Feasibility studies, Urban planning, Urban areas.

PB-168 293 Field 13F, 13B, 13M, 8G
CFSTI Prices: HC$2.00 MF$0.50

Dames and Moore, New York.
BORINGS 301 THROUGH 314 AND BORING 335. FOUNDATION INVESTIGATION, PROPOSED RAPID TRANSIT SYSTEM, WASHINGTON, D. C., FOR THE NATIONAL CAPITAL TRANSPORTATION AGENCY.
Preliminary rept., phase 2, priority 1,
by Gardner M. Reynolds and James V. Toto. 7 Dec 62, 29p
Unclassified report

See also PB-168 292.

Descriptors: (*Railroads, Underground structures), (*Underground structures, Railroads), (*Civil engineering, Underground structures), (*Transportation, District of Columbia), Foundations(Structures), Engineering geology, Soils, Structural geology, Well logging, Maps, Feasibility studies, Urban planning, Urban areas.

PB-168 294 Field 13F, 14A, 13B, 13M
CFSTI Prices: HC$2.00 MF$0.50

Smith (Larry), and Co., Washington, D. C.
CASE STUDY, USE OF EXCESS LAND AND AIR RIGHTS.
31 Aug 62, 50p
Unclassified report

Research supported by National Capital Transportation Agency, Washington, D. C. Original document contains color other than black and white and is available in limited supply. After present stock is exhausted, it will be available in black and white only.

Descriptors: (*Railroads, Underground structures), (*Underground structures, Railroads), (*Civil engineering, Underground structures), (*Transportation, District of Columbia), Costs, Urban planning, Government procurement, Law, Commerce, Urban areas.

An analysis was conducted, considering the real estate implications of the various alternative methods of developing a mass transit subway system through a segment of central Washington, in order to determine the possible implications of large scale land clearance on the cost of the transit system. The analysis has considered the cost aspects of clearance, reuse and possible resale, as it relates to over-all costs of the transit system. The study does not deal with the engineering or operating of the system but simply with the surface property rights in the right of way.

PB-168 295 Field 13B, 13C, 13F, 13M
CFSTI Prices: HC$3.00 MF$0.75

Parsons, Brinckerhoff, Quade and Douglas, New York.
DIFFICULT GROUND TUNNELLING TECHNIQUES.
Engineering study.
Dec 62, 71p
Contract NTA27 Unclassified report

Descriptors: (*Underground structures, Railroads), (*Railroads, Underground structures), (*Civil engineering, Underground structures), District of Columbia, Transportation, Construction, Engineering geology, Earth-handling equipment, Feasibility studies, Site selection, Urban planning.

This report presents the results of an engineering study conducted to review and evaluate present-day tunnelling techniques and to determine whether new or improved techniques could profitably be applied to proposed subway construction in the Washington, D. C. area. In addition, recommendations for a research and development program were to be made if warranted. In the conduct of this study, a review of available literature and technical articles from sources both in the United States and abroad was made, but was confined: first, to 'soft-ground' techniques and, second, to techniques developed within the last five to ten years. To supplement the review of current literature, consultations were held with experienced tunnel contractors and an 'on-the-site' inspection was made of the work presently underway in Toronto, Canada, and at the Brooklyn-Staten Island water tunnel in New York. From the review of current literature, several new and ingenious ideas for tunnelling through difficult ground, some of which have had noteworthy success, are discussed. Selected items of particular interest are listed in the bibliography, to which reference is made throughout the report. Where available, photographs or drawings of new developments are incorporated in the text of the report adjacent to the discussion of each development.

PB-168 296 Field 13B, 13M, 13F
CFSTI Prices: HC$1.00 MF$0.50

Day and Zimmermann, Inc., Philadelphia, Pa.
FEASIBILITY AND PLANT LOCATION STUDIES DESIGN AND CONSTRUCTION INDUSTRIAL ENGINEERING AND FACILITY STUDIES REPORTS, INVESTIGATIONS AND VALUATIONS MANAGEMENT,
by Thomas W. Hopper. 10 Oct 62, 12p
Contract NTA38
Unclassified report

Descriptors: (*Underground structures, Railroads), (*Railroads, Underground structures), (*Roads, Underground structures), (*Civil engineering, Underground structures), District of Columbia, Transportation, Urban planning, Construction, Costs, Feasibility studies, Site selection.

This report presents a preliminary study of construction cost estimates of two subways planned for motor bus operation, with the view to their ultimate conversion to rail operation.

PB-168 297 Field 13B, 13F

National Capital Transportation Agency,
Washington, D. C.
RECOMMENDATIONS FOR TRANSPORTATION IN THE NATIONAL CAPITAL REGION. FINANCE AND ORGANIZATION.
Rept. to the President.
1 Nov 62, 117p Unclassified report
Available from Superintendent of Documents, GPO, Washington, D. C. HC$1.00 as Y3.M21/21:2T68.
Available from CFSTI MF$0.75.

Descriptors: (*Urban planning, Transportation), (*Transportation, District of Columbia), (*Roads, District of Columbia), (*Railroads, District of Columbia), Traffic, Civil engineering, Underground structures, Research program administration, Feasibility studies, Costs.

Included in this report are: (1) A plan for a balanced regional system of highway and modern rapid transit facilities; (2) a program for immediate action to construct the transportation system; (3) recommendations for organization and financial arrangements for the system; and (4) an evaluation of the 1959 Mass Transportation Survey plan.

PB-168 298 Field 13B, 13F, 13M
CFSTI Prices: HC$5.00 MF$1.50

National Capital Transportation Agency,
Washington, D. C.
RECOMMENDATIONS FOR TRANSPORTATION IN THE NATIONAL CAPITAL REGION. APPENDIX. VOLUME I. ENGINEERING.
Rept. to the President. Unclassified report
4 Jan 63, 165p
Appendix to rept. dated 1 Nov 62. See also PB-168 297.

Descriptors: (*Transportation, District of Columbia), (*Civil engineering, Underground structures), (*Underground structures, Railroads), (*Railroads, District of Columbia), Urban planning, Railroad tracks, Railroad cars, Passenger vehicles, Specifications, Costs, Maps, Mechanical drawings.

This volume, the first of six appendices to the November 1962 report of the National Capital Transportation Agency, discusses the engineering aspects of the rail rapid transit system recommended by the Agency for the National Capital region. Subjects presented include route alignments and profiles, establishment of criteria for the system, methods of construction, costs of construction and equipment, and the status of transit technology.

PB-168 299 Field 13B, 13F, 13M
CFSTI Prices: HC$6.00 MF$2.00

National Capital Transportation Agency,
Washington, D. C.
RECOMMENDATIONS FOR TRANSPORTATION IN THE NATIONAL CAPITAL REGION. APPENDIX. VOLUME II. USE OF RAILROAD FACILITIES.
Rept. to the President.
4 Jan 63, 257p
Unclassified report

Appendix to rept. dated 1 Nov 62.
Rept. includes Study of Commuter Service Using Existing Railroad Facilities for Washington, D. C., by Louis T. Klauder and Associates, Philadelphia, Pa.
Original document contains color other than black and white and is available in limited supply. After present stock is exhausted, it will be available in black and white only.
See only PB-168 298.

Descriptors: (*Transportation, District of Columbia), (*Railroads, District of Columbia), (*Civil engineering, Railroads), Urban planning, Railroad tracks, Railroad cars, Passenger vehicles, Traffic, Buildings, Maps.

This volume of the Agency's technical appendices accompanying its November 1, 1962 report to the President is a study of use of existing railroad facilities. The contractor gave primary attention to possible use of four railroad lines: the Baltimore and Ohio Railroad lines to Rockville and to Laurel; the Pennsylvania Railroad line to Bowie and the Richmond, Fredicksburg and Potomac Railroad line to Springfield. As explained in Appendix Volume V, the Agency recommends (1) development of conventional railroad commuter services on the Pennsylvania Railroad line, and (2) use of railroad rights-of-way for rapid transit-type equipment and service between downtown Washington, on the one hand, and Rockville and Springfield, on the other hand. (Author)

PB-168 300 Field 13B, 13F
CFSTI Prices: HC$5.00 MF$1.00

National Capital Transportation Agency,
Washington, D. C.
RECOMMENDATIONS FOR TRANSPORTATION IN THE NATIONAL CAPITAL REGION. APPENDIX. VOLUME III. TRAFFIC FORECASTING.
Rept. to the President.
9 Jan 62, 159p Unclassified report
Appendix to rept. dated 1 Nov 62.
See also PB-168 299.

Descriptors: (*Transportation, District of Columbia), (*Urban planning, transportation), (*Traffic, Urban planning), (*Civil engineering, Transportation), Population, Passenger vehicles, Mathematical prediction.

The volume summarizes the work done by the Agency, in cooperation with the region's highway departments and planning agencies, to arrive at estimates of travel in the National Capital region of the future, including estimates of how many people will use public transportation and how many will use autos.

PB-168 301 Field 13B, 13F
CFSTI Prices: HC$6.00 MF$1.25

National Capital Transportation Agency,
Washington, D. C.
RECOMMENDATIONS FOR TRANSPORTATION IN THE NATIONAL CAPITAL REGION. APPENDIX, VOLUME IV. A MODEL FOR ESTIMATING TRAVEL MODE USAGE.
Rept. to the President.
Jan 63, 226p Unclassified report
Prepared by Traffic Research Corp., N. Y.
Appendix to rept. dated 1 Nov 62.
See also PB-168 300.

Descriptors: (*Transportation, District of Columbia), (*Urban planning, Transportation), (*Traffic, Urban planning), (*Civil engineering, Transportation), Population, Passenger vehicles, Mathematical prediction.

This volume is a reproduction of three reports which were originally published by Traffic Research Corporation of Toronto, Canada pursuant to contract with the Agency. These three reports detail the development of the process by which the Agency estimated the proportion of urban travelers which would elect to use transit or automobile facilities in the future. The three reports reproduced in this Volume are: (1) Derivation of modal split relationships and outline of modal split program block; (2) reconciliation and corroboration of Washington modal split relationships; and (3) corroborative modal split relationships based on Philadelphia data. (Author)

PB-168 302 Field 13B, 13F
CFSTI Prices: HC$4.00 MF$1.00

National Capital Transportation Agency,
Washington, D. C.
RECOMMENDATIONS FOR TRANSPORTATION IN THE NATIONAL CAPITAL REGION. APPENDIX. VOLUME V. SYSTEM PLANNING.
Rept. to the President.
1963, 133p Unclassified report

Appendix to rept. dated 1 Nov 62.
See also PB-168 301.

Descriptors: (*Transportation, District of Columbia), (*Urban planning, Transportation), (*Civil engineering, Transportation), Railroads, Roads, Passenger vehicles, Population, Systems engineering.

This volume of the Agency's Technical Appendices to its November 1962 Report to the President describes the transportation system recommended in the report and provides supporting data for the traffic, revenue and operating cost figures used in the report. It also describes the process by which the Agency arrived at its recommendations.

PB-168 303 Field 13B, 13F
CFSTI Prices: HC$4.00 MF$0.75

National Capital Transportation Agency,
Washington, D. C.
RECOMMENDATIONS FOR TRANSPORTATION IN THE NATIONAL CAPITAL REGION. APPENDIX, VOLUME VI. ORGANIZATION AND FINANCE.
Rept. to the President.
1963, 114p Unclassified report

Appendix to rept. dated 1 Nov 62.

Descriptors: (*Urban planning, Transportation), (*Transportation, District of Columbia), Civil engineering, Railroads, Roads, Underground structures, Research program administration, Construction, Costs, Money, Economics, Law.

The studies underlying this volume were conducted jointly by the Agency and independent financial and legal consultants. Chapter I is a report prepared by Wainwright and Ramsey, Inc., municipal financial consultants, New York, N. Y., discussing a number of possible arrangements for financing transportation in the National Capital region, and contains the consultant's recommendations. These recommendations were adopted by the Agency in its report to the President. Chapter II discusses the matter of organization for transportation in the National Capital region and contains an analysis of the legal problems involved. It was prepared by Hawkins, Delafield and Wood of New York, the Agency's legal consultant.

PB-168 304 Field 13B, 13F
CFSTI Prices: HC$7.00 MF$1.50

National Capital Transportation Agency,
Washington, D. C.
A STUDY OF BUS RAPID TRANSIT OPERATIONS FOR THE NATIONAL CAPITAL REGION.
Technical rept.
8 Jul 63, 327p Unclassified report

Rept. includes Appendices 1-4, Bus Capacity Requirements in a Rapid Transit System(Downtown Peak-Hour Conditions), H. O. Davidson, E. W. Marlowe, and M. J. Zubkoff, Contract NTA36, Technical rept. no. 203. Appendix 2, Ventilation for an Underground Transit System Using Diesel Buses, Kaiser Engineers, Washington, D. C. Appendix 3, Costs Estimates, Route 66 Comparisons. Appendix 4, Volume. Capacity Implications for bus Transportation. Central Business District, Wilbur Smith and Ass., Conn.
Original document contains color other than black and white and is available in limited supply. After present stock is exhausted, it will be available in black and white only.
See also PB-168 303.

Descriptors: (*Transportation, District of Columbia), (*Urban planning, Transportation), (*Civil engineering, Transportation), Passenger vehicles, Roads, Effectiveness, Feasibility studies.

This report summarizes a series of studies conducted by the National Capital Transportation Agency on the feasibility of using buses to provide transit service in certain segments of the National Capital region between now and 1980, as an alternative to the rapid transit system recommended by the Agency in its November 1961 Report to the President. The relative merits of bus and rail rapid transit in providing public transportation are examined. Differences in the two types of vehicle, and in the things each does best, preclude true comparability of service. Therefore only two phases of rail and bus transit systems are explored: (1) Qualitative differences between the services afforded, and (2) cost differentials.

PB-168 307 Field 13B, 13F
CFSTI Prices: HC$3.00 MF$0.50

Blair and Stein Associates, Washington, D. C.
AN EXPRESS STREET SYSTEM FOR THE NORTH CORRIDOR OF THE INNER LOOP, WASHINGTON, D. C.
Oct 62, 55p
Unclassified report

Original document contains color other than black and white and is available in limited supply. After present stock is exhausted, it will be available in black and white only.

Descriptors: (*Roads, District of Columbia), (*Urban planning, Roads), (*Transportation, District of Columbia), (*Civil engineering, Roads), Site selection, Passenger vehicles, Traffic, Optimization, Costs, Feasibility studies.

This report presents findings on a case study of an express street system as an alternative to the North Leg of the Inner Loop in Washington, D. C. The criteria for the study were to provide for a capacity of 2,500 to 3,500 vehicles at the peak hour in each direction with minimum disruption to existing development and maximum service and safety.

PB-168 308 Field 13B, 13F, 5K
CFSTI Prices: HC$1.00 MF$0.50

National Analysts, Inc., Philadelphia, Pa.
A SURVEY OF COMMUTER ATTITUDES TOWARD RAPID TRANSIT SYSTEMS. VOLUME I. THE PREFERENCE FOR RAPID TRANSIT AMONG NATIONAL CAPITAL REGION COMMUTERS TO DOWNTOWN D. C.
1963, 23p Unclassified report

Descriptors: (*Urban planning, Transportation), (*Transportation, District of Columbia), (*Public opinion, Transportation), Population, Sampling.

In the months of November and December 1962, a survey was conducted on a sample of 2,005 people who commute regularly to and from the downtown D. C. area. The purpose of this survey was to determine reactions and attitudes toward rapid transit as contrasted to other possible methods of transportation. This survey was conducted according to the latest accepted methods of scientific sampling (PB-168 310). Accordingly, the results of the survey can be projected to the total population of people living in the National Capital Region who commute regularly back and forth from the downtown D. C. area. The sponsor of this survey was unknown to both interviewers and respondents. Furthermore, the survey questionnaire was designed in such a manner as to avoid any possible bias in favor of one means of transportation to the detriment of others. As such, the survey results can be considered as objective, factual information regarding what people's current attitudes are toward various potential and existing forms of transportation. (Author)

PB-168 309 Field 13B, 13F, 5K
CFSTI Prices: HC$1.00 MF$0.50

National Analysts, Inc., Philadelphia, Pa.
A SURVEY OF COMMUTER ATTITUDES TOWARD RAPID TRANSIT SYSTEMS. VOLUME II. CHARACTERISTICS OF PROPOSED NEW RAPID TRANSIT SYSTEM WHICH WILL MAXIMIZE RIDERS.
Jul 63, 23p Unclassified report
See also PB-168 308.

Descriptors: (*Urban planning, Transportation), (*Transportation, District of Columbia), (*Public opinion, Transportation), Population, Sampling, Traffic, Optimization.

This report of the data obtained from 2,005 interviews among people in the Washington, D. C. area, who are regular commuters into the downtown district, covers those aspects of commuter preferences which relate to the construction and operation of a proposed new rapid transit system. Its goal is to point up those characteristics of such a rapid transit system which would be most likely to maximize potential usage. The engineering or design feasibility of the various characteristics of construction and operation discussed here are beyond the purview of this study and are, therefore, not mentioned. What are presented are both positive assertions by commuters as to what they would prefer in a new rapid transit system as well as deduced preferences based on stated objections to presently available public transportation. (Author)

PB-168 310 Field 13B, 13F, 5K
CFSTI Prices: HC$2.00 MF$0.50

National Analysts, Inc., Philadelphia, Pa.
A SURVEY OF COMMUTER ATTITUDES TOWARD RAPID TRANSIT SYSTEMS. VOLUME III-B. METHODOLOGICAL DESCRIPTION OF THE SURVEY.
1963, 38p
Unclassified report

Descriptors: (*Urban planning, Transportation), (*Transportation, District of Columbia), (*Public opinion, Transportation), Urban areas, Population, Sampling, Sociometrics.

The study design involved interviews in the National Capital Region plus comparable interviews in 'control' cities (defined as any city containing areas where commuters could choose between some form of rapid transit and a limited access highway). The control cities were as follows: Chicago, Philadelphia, and Toronto.

SC-DC-65-1256 Field 13H, 9A
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
BONDING TO METALLIC FILMS AND SOLID-STATE DEVICES,
by E. L. Chavez. Mar 65, 23p CONF-650308-1
Contract AT(29-1)-789
Unclassified report

Presented at the Calif. Circuits Assn. Symposium, Palo Alto, Calif.

Descriptors: (*Semiconducting films, Bonding), (*Semiconductor devices, Bonding).

SC-DR-64-2135 Field 13H, 11I
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
DESIGN PRINCIPLES FOR MOLDED PLASTIC POTTING SHELLS,
by Edward A. Salazar. Feb 65, 9p
Contract AT(29-1)-789
Unclassified report

Descriptors: (*Plastics, Molding), (*Molding materials, Plastics).

SC-R-64-1366 Field 13L, 21B, 21D
CFSTI Prices: HC$2.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
HEAT TRANSFER IN LIQUID HYDROCARBON FUEL FIRES,
by B. E. Bader. Dec 64, 45p CONF-641201-14
Contract AT(29-1)-789
Unclassified report

Presented at American Institute of Chemical Engineers Annual Meeting, Boston, 6-10 Dec 64.

Descriptors: (*Fires, Heat transfer), (*Fuels, Fires).

UCRL-7739 Field 13I, 13A
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
MEASUREMENT OF PREFERRED ORIENTATION IN BALL BEARINGS BY ULTRASONIC METHODS,
by H. L. Dunegan. 24 Feb 64, 6p
Contract W-7405-eng-48
Unclassified report

Descriptors: (*Ball bearings, Non-destructive testing), (*Corrosion, Ball bearings), Ultrasonic radiation.

UCRL-12252 Field 13H
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
MORPHOLOGICAL OBSERVATIONS AFTER DISTILLATION OF BERYLLIUM FROM THE SOLID STATE AT HIGH TEMPERATURES,
by R. F. Bunshah. 15 Feb 65, 20p CONF-650508-1
Contract W-7405-eng-48 Unclassified report

Presented at the International Conference on Berryllium Metallurgy, Grenoble, France.

Descriptors: (*Berryllium, Metallurgy), (*Metallurgy, Beryllium).

WCAP-3269-27 Field 13I, 18I
CFSTI Prices: HC$2.00 MF$0.50

Westinghouse Electric Corp., Pittsburgh, Pa. Atomic Power Div.
FRICTION-SPEED CHARACTERISTICS OF THRUST BEARINGS FOR REACTOR COOLANT PUMPS,
by John Boyd and A. A. Raimondi. Oct 63, 30p
Contract AT(30-1)-3269
Unclassified report

Descriptors: (*Thrust bearings, Coolant pumps), (*Reactor coolants, Coolant pumps).

14. Methods and Equipment

AD-459 952 Field 14B, 17G
CFSTI Price: HC$4.00

Kearfott Co., Inc., Clifton, N. J.
FEASIBILITY STUDY OF AN INERTIAL NAVIGATION EQUIPMENT TESTING FACILITY AT NADC, JOHNSVILLE, PENNSYLVANIA.
1958, 131p Publication no. C-7218-1F
Contract NBy13017 Unclassified report
Available copy will not permit fully legible reproduction.

Descriptors: (*Test facilities, Inertial navigation), (*Inertial navigation, Test facilities), Feasibility studies, Site selection, Soils, Costs, Buildings, Seismographs, Design, Air conditioning equipment, Electric power production, Acceleration, Measurement.

This feasibility study presents an investigation of the relative merits of three proposed sites for the location of an inertial navigation and guidance evaluation and development facilities building at NADEVCEN. The data includes: (1) Evaluation of the magnitudes and frequencies of both natural and artificially generated disturbances, shocks and vibrations present in the bed rock and the overlaying soil. (2) Soil testing and foundation report including foundation design recommendations, log of soil strata, and other pertinent data. (3) Comparative economic study of the three alternate sites. A cost estimate, along with plot plans, of the most desireable area has been prepared. Included are design recommendations and facility specifications for the building and its test areas. (Author)

BNL-8812 Field 14B
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
STABILITY OF A RHENIUM - GRAPHITE THERMOCOUPLE,
by F. J. Salzano. 1963, 8p CONF-650204-1
Contract AT(30-2)-GEN-16 Unclassified report
Presented at the meeting on thermocouple technology and the effects of nuclear radiation on thermocouples, Washington, D. C.

Descriptors: (*Thermocouples, Stability), (*Rhenium, Thermocouples), Graphite.

LA-3089 Field 14B
CFSTI Prices: HC$3.00 MF$0.75

Los Alamos Scientific Lab., Univ. of California, N. Mex.
LARGE EXPLOSIVE-DRIVEN PLYWOOD SHOCK TUBES,
by John W. Taylor and Richard Gentry. May 64, 97p
Contract W-7405-eng-36 Unclassified report

Descriptors: (*Shock tubes, Plywood).

LADC-5923 Field 14B
CFSTI Prices: HC$2.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
EVALUATION OF PARTICLE SIZING AND AEROSOL SAMPLING TECHNIQUES,
by Harry J. Ettinger and Samuel Posner. 1963, 31p
CONF-496-1 Unclassified report
Contract W-7405-eng-36
Presented at the American Industrial Hygiene Association Meeting, Philadelphia, Pa. Apr. 64.

Descriptors: (*Aerosols, Samplers), (*Particle size, Aerosols).

ORNL-3649 (vol 2)(sec 2.1) Field 14B
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
SMOOTHED THERMOCOUPLE TABLES OF EXTENDED SIGNIFICANCE (ZERO C). VOLUME 2, SECTION 2.1: PLATINUM VS PLATINUM - 10 PERCENT RHODIUM THERMOCOUPLES,
by R. K. Adams and E. G. Davisson. Mar 65, 53p
Contract W-7495-eng-26
Unclassified report

Descriptors: (*Thermocouples, Tables), (*Platinum, Thermocouples), Platinum alloys.

ORNL-3649 (vol 2)(sec 2.2) Field 14B
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
SMOOTHED THERMOCOUPLE TABLES OF EXTENDED SIGNIFICANCE (ZERO C). VOLUME 2, SECTION 2.2: PLATINUM VS PLATINUM - 13 PERCENT RHODIUM THERMOCOUPLES,
by R. K. Adams and E. G. Davisson. Mar 65, 51p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Thermocouples, Tables), (*Platinum, Thermocouples), Platinum alloys.

ORNL-3649(vol 2)(sec 2.3) Field 14B
CFSTI Prices: HC$3.00 MF$0.50

Oak Ridge National Lab., Tenn.
SMOOTHED THERMOCOUPLE TABLES OF EXTENDED SIGNIFICANCE (ZERO C). VOLUME 2, SECTION 2.3: CHROMEL - ALUMEL THERMOCOUPLES.
by R. K. Adams and E. G. Davisson. Mar 65, 51p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Thermocouples, Tables), (*Nickel alloys, Thermocouples), Aluminum alloys, Chromium alloys.

ORNL-3649(vol 2) (sec 2.4) Field 14B
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
SMOOTHED THERMOCOUPLE TABLES OF EXTENDED SIGNIFICANCE (ZERO C). VOLUME 2, SECTION 2.4: IRON - CONSTANTAN THERMOCOUPLES,
by R. K. Adams and E. G. Davisson. Mar 65, 32p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Thermocouples, Tables), (*Iron, Thermocouples), Copper alloys.

ORNL-3649 (vol 2)(sec 2.5) Field 14B
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
SMOOTHED THERMOCOUPLE TABLES OF EXTENDED SIGNIFICANCE (ZERO C). VOLUME 2, SECTION 2.5: COPPER - CONSTANTAN THERMOCOUPLES,
by R. K. Adams and E. G. Davisson. Mar 65, 26p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Thermocouples, Tables), (*Copper, Thermocouples), Copper alloys.

ORNL-3649 (vol 2)(sec 2.6) Field 14B
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
SMOOTHED THERMOCOUPLE TABLES OF EXTENDED SIGNIFICANCE (ZERO C). VOLUME 2, SECTION 2.6: CHROMEL - CONSTANTAN THERMOCOUPLES,
by R. K. Adams and E. G. Davisson. Mar 65, 36p
N65-20151
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Thermocouples, Tables), (*Nickel alloys, Thermocouples), Copper alloys, Chromium alloys.

ORNL-3649 (Vol. 2) (Sec. 2.7) Field 14B
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
SMOOTHED THERMOCOUPLE TABLES OF EXTENDED SIGNIFICANCE (ZERO C). VOLUME 2, SECTION 2.7: TUNGSTEN VS TUNGSTEN - 26 PERCENT RHENIUM THERMOCOUPLES,
by R. K. Adams and E. G. Davisson. Mar 65, 67p
N65-20152
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Thermocouples, Tables), (*Tungsten, Thermocouples), Tungsten alloys, Rhenium alloys.

ORNL-3649 (vol 2)(sec 2.8) Field 14B
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
SMOOTHED THERMOCOUPLE TABLES OF EXTENDED SIGNIFICANCE (ZERO C). VOLUME 2, SECTION 2.8: TUNGSTEN - 5 PERCENT RHENIUM VS TUNGSTEN 26 PERCENT RHENIUM THERMOCOUPLES,
by R. K. Adams and E. G. Davisson. Mar 65, 66p
N65-20153 Unclassified report
Contract W-7405-eng-26

Descriptors: (*Thermocouples, Tables), (*Tungsten alloys, Thermocouples).

ORNL-3649 (vol 2) (sec 2.9) Field 14B
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
SMOOTHED THERMOCOUPLE TABLES OF EXTENDED SIGNIFICANCE (ZERO C). VOLUME 2, SECTION 2.9: TUNGSTEN - 3 PERCENT RHENIUM VS TUNGSTEN - 25 PERCENT RHENIUM THERMOCOUPLES.

by R. K. Adams and E. G. Davisson. Mar 65, 68p
N65-20154
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Thermocouples, Tables), (*Tungsten alloys, Thermocouples), Rhenium alloys.

ORNL-3649 (vol 2)(sec 2.10) Field 14B
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
SMOOTHED THERMOCOUPLE TABLES OF EXTENDED SIGNIFICANCE (ZERO C). VOLUME 2, SECTION 2.10: GOLD - 2.1 PERCENT COBALT VS COPPER CRYOGENIC THERMOCOUPLES.
by R. K. Adams and E. G. Davisson. Mar 65, 13p
N65-20155
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Thermocouples, Tables), (*Gold, Thermocouples), Cryogenics, Cobalt alloys, Copper alloys.

ORNL-3649 (vol 2)(sec 2.11) Field 14B
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
SMOOTHED THERMOCOUPLE TABLES OF EXTENDED SIGNIFICANCE. VOLUME 2, SECTION 2.11: CONSTANTAN - COPPER CRYOGENIC THERMOCOUPLES.
by R. K. Adams and E. G. Davisson. Mar 65, 13p
N65-20156
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Thermocouples, Tables), (*Copper alloys, Thermocouples), Copper, Cryogenics.

ORNL-3650 Field 14B, 6R
CFSTI Prices: HC$6.00 MF$1.25

Oak Ridge National Lab., Tenn.
OAK RIDGE NATIONAL LABORATORY ANNUAL PROGRESS REPORT, 1963.
1964, 251p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Health physics, Nuclear physics laboratories), (*Nuclear physics laboratories, Health physics).

ORNL-P-1066 Field 14B, 18H
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
IN-PILE PERFORMANCE OF HIGH-TEMPERATURE THERMOCOUPLES,
by R. M. Carroll and P. E. Reagan. 1965, 9p
CONF-650204-2
Contract W-7405-eng-26

Unclassified report

Presented at the Meeting on Thermocouple Technology and the Effects of Nuclear Radiation on Thermocouples, Washington, D. C.

Descriptors: (*Thermocouples, Radiation damage).

ORNL-P-1068 Field 14B
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
DYNAMIC GAS THERMOMETRY,
by E. W. Hagen. 1965, 8p CONF-650204-5
Contract W-7405-eng-26 Unclassified report

Presented at the Meeting on Thermocouple Technology and The Effects of Nuclear Radiation on thermocouples, Washington, D. C.

Descriptors: (*Thermometers, Gas flow), (*Transonic nozzles, Fluid dynamic properties).

ORNL-P-1069 Field 14B
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
HIGH-TEMPERATURE HIGH-VACUUM THERMOCOUPLE DRIFT TESTS,
by J. W. Hendricks and D. L. McElroy. 1964, 30p
CONF-650204-3
Contract W-7405-eng-26

Unclassified report

Presented at the Meeting on Thermocouple Technology and The Effects of Nuclear Radiation On Thermocouples, Washington, D. C.

Descriptors: (*Thermocouples, Radiation effects).

ORNL-TM-990 Field 14B, 11F, 13H
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
NONDESTRUCTIVE EVALUATION OF T-111 AND B-66 ALLOY TUBING,
by K. V. Cook and R. W. McClung. Feb 65, 27p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Non-destructive testing, Pipes), (*Alloys, Non-destructive testing).

Patent 3,196,677 Field 14B, 13G

CYCLIC PRESSURE LOADING SYSTEM.
Patent assigned to Navy,
by Paul P. Day, Ralph B. Allnutt and Alexander B. Stavovy.
27 Jul 65

Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Pressure vessels, Controlled atmospheres), (*Controlled atmosphers, Pressure vessels), High-pressure research, Model tests, Pressure, Periodic variations, Environmental tests, Pneumatic devices, Patents.

A model is dynamically pressure tested in a closed environmental test tank by maintaining the tank at a constant pressure higher than atmospheric and introducing varying pressures only in the model to thereby produce varying differential pressure loading on the model.

PB-168 200 Field 14E, 9B
CFSTI Prices: HC$1.00 MF$0.50

Massachusetts Inst. of Tech., Cambridge. Cooperative Computing Lab.

COMPUTER CONTROLLED PRINTING,
by M. P. Barnett, D. J. Moss, D. A. Luce, and K. L. Kelley. 1963, 9p Unclassified report
Grant PHS RG10430
Proceedings of the Spring Computer Conference v23 p263-71 1963.

Descriptors: (*Computers, Printing), (*Printing, Computers), (*Photographic recording systems, Printing), Lithography, Control systems, Punched tape, Programming(Computers), Optical equipment.

This paper describes some of the characteristics and applications of programs that have been developed recently in the author's laboratory, for the production of coded paper tapes to control the Photon photocomposing machine. Conventional typesetting machines have been supplemented in the last two decades by a variety of photocomposing machines that produce the original copy for photolithographic reproduction by a photographic process. In this process, images of letters and characters are focused by an optical system at appropriate positions of a roll of sensitized paper. A photocomposing machine contains a matrix of transparent characters in an opaque background, with a mechanism for illuminating one selected character at a time. Several types of photocomposing machines have been designed and manufactured. The work that is reported here has used some Photon machines that are installed in Boston, and which are equipped with paper tape readers.

PB-168 201 Field 14E, 9B
CFSTI Prices: HC$1.00 MF$0.50

Cornell Aeronautical Lab., Inc., Buffalo, N. Y.
DESIGN OF A PHOTO INTERPRETATION AUTOMATON,
by W. S. Holmes, H. R. Leland, and G. E. Richmond. 1962, 9p
Unclassified report

Proceedings of the Fall Joint Computer Conference, v22 p27-35 1962.
Available copy will not permit fully legible reproduction.

Descriptors: (*Photointerpretation, Automata), Pattern recognition, Photointerpretability.

Objects of interest are categorized in two different ways. Simple objects, such as buildings, aircraft, ships, and tanks are distinguished from complexes, or complex objects. Simple objects are categorized, according to their length-to-width ratios, as being either blobs or ribbons. The detection of simple objects is accomplished separately for ribbons and for blobs. The preprocessing which is carried out in the first portion of the system solves several of the problems inherent in the use of a simple pattern-recognition device to aid in the photo interpretation problem. The function performed at the object identification level is that of identifying the blobs which have previously been detected, isolated, and standardized. At the complex object level, the location and identification information available from the simple object-level outputs is combined and appropriately weighted to identify objects at a higher level of complexity. An illustrative example is the combination of aircraft (simple objects) near a runway (another simple object) and a group of buildings (each a simple object) to determine the existence of an airfield.

PB-168 256 Field 14E, 9B, 5B
CFSTI Prices: HC$4.00 MF$0.75

Inforonics, Inc., Maynard, Mass.

MACHINE RECORDING OF TEXTUAL INFORMATION DURING THE PUBLICATION OF SCIENTIFIC JOURNALS.
Rept. for 1 Jan 63-30 May 65,
by Lawrence F. Buckland. 30 May 65, 106p
Contract NSF C305
Unclassified report

Descriptors: (*Journals, Printing), (*Printing, Journals), Computers, Programming(Computers), Abstracting, Indexes, Reports, Data, Subject indexing, Automatic, Coding.

A program of research was undertaken to develop publishing and computer processing techniques for recording textual data in machine form at the time of primary journal publication. The purpose of recording journal data in machine form is so that it can be processed with the aid of machines to form secondary products, such as indexes and abstract journals. The approach to this objective consisted of two steps. The first, and most important, step of the project was the development of a system for recording journal articles so that text items were identified according to their functional end use. Next, transformation procedures were developed to convert the recorded data to the forms of the primary journal, indexes, abstract publications, and a data file. (Author)

PB-168 289 Field 14B, 19A, 9C
CFSTI Prices: HC$4.00 MF$0.75

Denver Research Inst., Colo.
TEST EQUIPMENT FOR AND EVALUATION OF ELECTROMAGNETIC RADIATION. VOLUME I. APPLICATION OF EVAPORATED THERMOCOUPLES TO DETECTION OF RF POWER IN BRIDGE WIRES OF ELECTRO-EXPLOSIVE DEVICES.
Final rept., vol. 1, 15 Mar 57-30 Nov 60,
by R. C. Amme, R. F. Calfee, J. G. Hewitt, J. E. Nunnally, and D. E. Rugg. 30 Nov 60, 106p
Contract N123 60530 10049A
AD 250 090
Unclassified report

See also AD-257 985.

Descriptors: (*Electromagnetic waves, hazards), (*Hazards, Explosive initiators), (*Thermocouples, Electromagnetic waves), Test equipment, Metal films, Vapor plating, Vacuum apparatus, Thermoelectricity, Resistance(Electrical), Simulation, Monitors, Sensitivity, Radiofrequency power, Heat transfer, Aging(Materials), Pests.

A review of the development and a discussion of the present status of vacuum deposited thermocouples are given. Measurements of thermoelectric powers and resistivities of evaporated films are given as a function of age for various thicknesses. Also presented are the effects of heat on film resistances and thermoelectric powers and studies of 'alumel' films. A multiple beam interferometer capable of measuring film thickness to ± 20 A has been constructed and a description is included. Improvements in vacuum deposition methods and thermocouple fabrication are described. A reference heat source capable of providing steady heat output as well as chopped radiation up to 100 cps is described. Results of tests attempting to determine aging characteristics, effect of humidity and effect of thermocouple coating materials are presented. In addition, tests of the effects of organic solvent vapors are reported. Thin film substrate thermocouples having time constants of about 10 milliseconds which have been developed are described. Results of measurements of Mk 1 squib bridge wire temperature rise above ambient as a function of current are given with corresponding vacuum deposited thermocouple sensitivities. (Author)

SC-DC-65-1123 Field 14B
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
NEW FRONTIERS FOR NONDESTRUCTIVE TESTING IN THE NUCLEAR AGE,
by Douglas W. Ballard. 1965, 19p CONF-650509-3
Contract AT(29-1)-789
Unclassified report

Presented at IAEA Symposium on Nondestructive Testing in Nuclear Technology, Bucharest, 17-21 May 65.

Descriptors: (*Non-destructive testing, Reviews).

SCL-DR-64-128 Field 14B, 10C
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Livermore, Calif.
A TRANSISTORIZED, 25-AMPERE CONSTANT-CURRENT BATTERY DISCHARGER,
by G. E. Overturf. Nov 64, 15p
Contract AT(29-1)-789
Unclassified report

Descriptors: (*Electric discharges, Test equipment), (*Batteries + components, Test equipment).

SC-R-64-1376 Field 14D, 12A
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
TREE DIAGRAMS APPLIED IN ANALYSIS OF TIME DEPENDENT SYSTEM FAILURE RATES,
by F. W. Mueller. Nov 64, 16p
Contract AT(29-1)-789
Unclassified report

Descriptors: (*Reliability(Electronics), Probability), (*Topology, Probability).

SC-TM-64-921 Field 14B
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
A SWEEP-FREQUENCY MULTIPOINT CALIBRATOR FOR FREQUENCY-MEASURING DEVICES,
by R. G. Bemis. Mar 65, 19p Unclassified report
Contract AT(29-1)-789
Descriptors: (*Calibration, Measuring devices-(Electrical + electronic), (*Measuring devices(Electrical + electronic), Calibration.

SC-TM-64-1668 Field 14B
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
GALVANOMETER SELECTION,
by G. A. Nigg. Nov 64, 13p
Contract AT(29-1)-789
Unclassified report

Descriptors: (*Galvanometers, Selection).

SC-TM-64-1722 Field 14B
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
IMPROVEMENTS IN USE OF THE INDIUM ADHESION TEST FOR SURFACE CLEANLINESS,
by G. L. Krieger. Nov 64, 17p
Contract AT(29-1)-789
Unclassified report

Descriptors: (*Contamination, Surfaces), (*Adhesion, Tests).

SC-TM-65-31 Field 14B
CFSTI Prices: HC$2.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
FORCE-CONTROLLED VIBRATION TESTING,
by J. V. Otts. Feb 65, 36p
Contract AT(29-1)-789
Unclassified report

Descriptors: (*Vibration, Test methods).

UCRL-7780 Field 14E
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
A DRYING CHAMBER FOR RAPID-ACCESS FILM PROCESSING,
by Fred W. Buys. 24 Mar 64, 9p
Contract W-7405-eng-48
Unclassified report

Descriptors: (*Photographic driers, High-speed photography), (*High-speed photography, Photographic driers).

WAPD-291 Field 14B
CFSTI Prices: HC$2.00 MF$0.50

Bettis Atomic Power Lab., Pittsburgh, Pa.
AN APPARATUS FOR THE MEASUREMENT OF THE THERMAL CONDUCTIVITY OF UNIRRADIATED AND (REMOTELY) OF IRRADIATED SOLIDS IN THE RANGE 100 TO 200 DEGREE C,
by D. Jaffe. Jan 65, 29p
Contract AT(11-1)-GEN-14
Unclassified report

Descriptors: (*Thermal conductivity, Measurement), (*Laboratory equipment, Thermal conductivity), Test equipment.

15. Military Sciences

COO-281 Field 15C, 15B
CFSTI Prices: HC$3.00 MF$0.75

Chicago Operations Office (AEC), Ill. Health and Safety Div.
RADIOLOGICAL ASSISTANCE PLAN HANDBOOK, REGION FIVE,
comp. by A. Wendell. Feb 65, 80p
Unclassified report

Descriptors: (*Safety, Radiological warfare), (*Civil defense systems, Radiological warfare), Radioactive fallout.

ORNL-P-1093 Field 15C, 15B
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
CIVIL DEFENSE RESEARCH AT OAK RIDGE NATIONAL LABORATORY,
by J. C. Bresea. 1965, 31p CONF-650211-1
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Civil defense systems, Scientific research).

ORNL-TM-1067 Field 15B, 15C
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
EMERGENCY ENVIRONMENTAL CONTROL SYSTEM FOR THE TUNNEL GRID SHELTER,
by C. D. Scott and J. M. Holmes. 18 Jan 65, 17p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Civil defense systems, Shelters), (*Shelters, Control systems).

ONRL-TM-1089 Field 15B
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
THE CAPABILITY, CREDIBILITY, AND DESIRABILITY OF BLAST SHELTER SYSTEMS. A SYSTEM FOR ANALYSIS,
by Sue Berryman Bobrow. May 65, 22p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Shelters, Feasibility studies).

16. Missile Technology

Patent 3,196,199 Field 16A, 5I, 13J

MULTI-CHANNEL TRANSPONDER.
Patent assigned to Navy,
by Samuel Wolf and Frederick J. Conrad. 20 Jul 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Training devices, Launching), (*Transponders, Simulators), Guided missiles, Sonar, Input-output devices, Submarines, Underwater, Signals, Water, Surface properties.

The transponder system is for simulating certain water characteristics to be utilized in a computer for determining such things as underwater launch correction factors for missiles. The system simulates conditions of water depth and the like on a submarine from which a missile is to be launched. The system has a plurality of inputs and outputs for receiving interrogating signals and transmitting hypothetical depth and wave motion echo signals to a water characteristics computation system.

17. Navigation, Communications, Detection, and Countermeasures

Patent 3,197,767 Field 17I

APPARATUS FOR ELECTRONIC TIME COMPRESSION.
Patent assigned to Army,
by Munsey E. Crost. 27 Jul 65 Unclassified patent
Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Display systems, Radar equipment), (*Storage tubes, Radar equipment), Radar images, Data storage systems, Oscilloscopes, Search radar, Air traffic control systems, Early warning systems, Patents.
The device displays the position and motion of objects detected by a radar system. It is useful in air-traffic-control systems, early-warning systems, and the like. An arrangement is shown for the immediate display of the past and present positions of objects by the successive display of several previous-history images of the object at a rate which is considerably faster than the rate at which the images were acquired. The most recent image may be displayed instantaneously with the acquisition of that image.

Patent 3,197,771 Field 17I, 9A

SIGNAL DETECTION, THRESHOLDING SWITCHING SYSTEM.
Patent assigned to Navy,
by Alfred I. Mintzer and Anton J. Lisicky.
27 Jul 65 Unclassified patent
Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Search radar, Switching circuits), (*Switching circuits, Search radar), Radar tracking, Automatic, Noise(Radar), Gates(Circuits), Patents.
The radar circuitry is for the automatic detection and tracking of a target in a preselected sector of search. Circuitry is disclosed wherein energization of a first threshold circuit having reduced sensitivity actuates a second threshold circuit having improved sensitivity in preparation for generation of a final lock-on tracking signal.

SC-R-64-1314 Field 17B
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
A COMMUNICATION SYSTEM WITH ADAPTIVE DECODING,
by A. M. Breipohl and A. H. Koachmann. Dec 64,
20p CONF-776-8 Unclassified report
Contract AT(29-1)-789
Presented at National Electronics Conference, Chicago, Oct 64.

Descriptors: (*Adaptive communication systems, Decoding)

SC-TM-65-44 Field 17I
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
CLOSE-IN TRACKING ERROR IN INTERFEROMETER TRACKING SYSTEMS,
by W. D. Gutscher. Feb 65, 12p Unclassified report
Contract AT(29-1)-789
Descriptors: (*Radar tracking, Errors), (*Interferometers, Radar tracking).

18. Nuclear Science and Technology

ABCC-OO-63 Field 18C, 6R
CFSTI Prices: HC$1.00 MF$0.50

Atomic Bomb Casualty Commission, Hiroshima (Japan).
BIBLIOGRAPHY OF PUBLISHED PAPERS OF THE ATOMIC BOMB CASUALTY COMMISSION.
Technical rept.
1963, 6p Unclassified report
Contract AT(49-1)-GEN-72
Descriptors: (*Nuclear explosions, Casualties), Bibliographies.

ANL-6750 Field 18J
CFSTI Prices: HC$2.00 MF$0.50

Argonne National Lab., Ill.
IRRADIATIONS OF U - 20PU - 10FS ALLOY FUEL RODS,
by W. N. Beck, J. H. Kittel and R. J. Fousek.
Feb 65, 32p
Contract W-31-109-eng-38
Unclassified report

Descriptors: (*Reactor fuel rods, Uranium alloys), (*Reactor fuel cladding, Radiation damage).

ANL-6845 Field 18J
CFSTI Prices: HC$3.00 MF$0.50

Argonne National Lab., Ill.
STUDIES OF FAST REACTOR FUEL ELEMENT BEHAVIOR UNDER TRANSIENT HEATING TO FAILURE. II. IN-PILE EXPERIMENTS ON UO2 SAMPLES IN THE ABSENCE OF COOLANT,
by C. E. Dickerman, L. E. Robinson, E. S. Sowa, and S. B. Skladzien. Jan 65, 47p Unclassified report
Contract W-31-109-eng-38
Descriptors: (*Fast reactors, Reactor fuel elements), (*Reactor fuel elements, Reactor coolants).

ANL-6945 Field 18H, 6R
CFSTI Prices: HC$3.00 MF$0.75

Argonne National Lab., Ill.
ENVIRONMENTAL RADIOACTIVITY AT ARGONNE NATIONAL LABORATORY.
Rept for 1962 - 1963,
by J. Sedlet and F. S. Iwami. Jan 65, 62p
Contract W-31-109-eng-38
Unclassified report

Descriptors: (*Radiological contamination, Measurement), (*Radioactive fallout, Sampling).

BMI-X-316 Field 18J
CFSTI Prices: HC$1.00 MF$0.50

Battelle Memorial Inst., Columbus, Ohio.
CORROSION INVESTIGATION OF HYMU 80, INOR-8, AND L NICKEL UNDER FLUORINATION CONDITIONS FOR PROCESSING ALUMINUM USING THE MOLTEN-SALT FLUORIDE. VOLATILITY METHOD,
by P. D. Miller, E. F. Stephan, and W. N. Stiegelmeyer.
30 Oct 64, 13p
Unclassified report

Descriptors: (*Corrosion, Alloys), (*Fluorination, Corrosion).

BNL-8754 Field 18L, 18L
CFSTI Prices: HC$3.00 MF$0.75

Brookhaven National Lab., Upton, N. Y.
THE IMPACT OF INTEGRATED MULTIPURPOSE NUCLEAR PLANTS ON THE CHEMICAL AND METALLURGICAL PROCESS INDUSTRIES. I. ELECTRO-CHEMONUCLEAR SYSTEMS.
by Meyer Steinberg. Dec 64, 64p
Contract AT-30-2-GEN-16
Unclassified report

Descriptors: (*Power reactors, Chemical industry), (*Nuclear power plants, Metallurgy).

BNL-8817 Field 18D, 20G
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
THE HEAVY LIQUID BUBBLE CHAMBER FOR A 1000-BEV ACCELERATOR,
by A. Rousset. 14 Jan 65, 16p
Contract AT(30-2)-GEN-16
Unclassified report

Descriptors: (*Bubble chambers, Particle accelerators), (*Particle accelerators, Bubble chambers).

BNL-8972 Field 18F, 20G
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
PERSONNEL SECURITY AT THE BROOKHAVEN ALTERNATING GRADIENT SYNCHROTRON,
by R. R. Kassner and W. Livant. 10 Mar 65, 6p
CONF-650306-16
Contract AT(30-2)-GEN-16
Unclassified report

Presented at the Particle Accelerator Conference, Washington, D. C.

Descriptors: (*Radiation hazards, Synchrotrons), (*Synchrotrons, Alternating gradient focusing accelerators).

BNWL-2 Field 18J
CFSTI Prices: HC$3.00 MF$0.50

Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
PRTR SECOND GENERATION SHIM ASSEMBLY,
by D. E. Rasmussen. Nov 64, 51p
Contract AT(45-1)-1830
Unclassified report

Descriptors: (*Control rods, Test reactors), (*Test reactors, Heavy water reactors).

CEND-2936-222 Field 18J
CFSTI Prices: HC$5.00 MF$1.25

Combustion Engineering, Inc., Windsor, Conn. Nuclear Div.
IRRADIATION TESTING OF CERAMIC FUELS.
Interim rept. 1 Oct 63-30 Nov 64,
by G. Zuromsky, J. J. Koziol and W. P. Chernock.
Dec 64, 173p
Contract AT(30-1)-2936
Unclassified report

Descriptors: (*Ceramic materials, Reactor fuels), (*Reactor fuels, Tests).

CEND-3107-224 Field 18J, 11B
CFSTI Prices: HC$2.00 MF$0.50

Combustion Engineering, Inc., Windsor, Conn.
Nuclear Div.
BURNABLE POISON ADDITIONS TO UO 2.
Progress rept. 1 Jul 30 Sep 64,
by R. C. Brayer and W. P. Chernock. Oct 64, 36p
EURAEC-1240
Contract AT(30-1)-3107

Unclassified report

Descriptors: (*Reactor fuels, Burnable poisons), (*Burnable poisons, Reactor fuels).

CEND-3336-229 Field 18J
CFSTI Prices: HC$1.00 MF$0.50

Combustion Engineering, Inc., Windsor, Conn.
Nuclear Div.
DEVELOPMENT AND TESTING OF A TEMPERATURE TRANSIENT METHOD FOR PERFORMING IN-PILE THERMAL CONDUCTANCE TESTING.
Progress rept. 1 Oct - 31 Dec 64,
by C. E. Burdg, J. R. Parrotee, and R. I. Brockett.
Feb 65, 19p EURAEC-1307
Contract AT(30-1)-3336

Unclassified report

Descriptors: (*Reactor fuel elements, Temperature), (*Thermal conductivity, Reactor fuel elements).

CEX-65.02 Field 18H, 20H
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
TECHNICAL CONCEPT: OPERATION HENRE,
by F. F. Haywood and J. A. Auxier. Feb 65, 25p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Neutron transport theory, Troposphere), (*Troposphere, Neutron transport theory).

CONF-654-24 Field 18K, 18I, 12A
CFSTI Prices: HC$1.00 MF$0.50

Knolls Atomic Power Lab., Schenectady, N. Y.
A METHOD OF AVERAGING DIFFUSION COEFFICIENTS,
by P. A. Ombrellaro and P. J. von Herrmann. Nov 64, 13p
Contract W-31-109-eng-52

Unclassified report

Presented at the American Nuclear Society Meeting, San Francisco, 30 Nov-3 Dec 64.

Descriptors: (*Neutron transport theory, Numerical methods and procedures), (*Diffusion, Numerical methods and procedures).

CONF-654-32 Field 18I, 18J
CFSTI Prices: HC$1.00 MF$0.50

Knolls Atomic Power Lab., Schenectady, N. Y.
SELF-SHIELDING IN CLOSELY SPACED SLAB LATTICES,
by S. W. Kitchen and K. R. Edgar. 1964, 21p
Contract W-31-109-eng-52

Unclassified report

Presented at the American Nuclear Society Meeting, San Francisco, 30 Nov-3 Dec 64.

Descriptors: (*Reactor lattice parameters, Reactor shielding materials), (*Reactor fuel elements, Reactor shielding materials).

CONF-654-41 Field 18L, 18J
CFSTI Prices: HC$1.00 MF$0.50

Westinghouse Electric Corp., Pittsburgh, Pa. Atomic Power Div.
PERFORMANCE OF THIN-WALLED STAINLESS STEEL CLAD ROD TYPE FUEL ELEMENTS IN SAXTON,
by D. R. McClintock, E. Paxson, and H. M. Ferrari.
1964, 25p AED-CONF-64-219-18
Contract AT(30-1)-3269

Unclassified report

Presented at American Nuclear Society Meeting, San Francisco, 30 Nov-3 Dec 64.

Descriptors: (*Reactor fuel cladding, Performance-(Engineering)), (*Stainless steel, Reactor fuel cladding).

CONF-641009-9 Field 18H, 18J
CFSTI Prices: HC$1.00 MF$0.50

Westinghouse Electric Corp., Pittsburgh, Pa.
Astronuclear Lab.
INPILE TEST LOOP AT THE PLUM BROOK REACTOR FACILITY,
by S. S. Stein. 1964, 25p AED-CONF-64-193-1
Contract SNP-1

Unclassified report

Presented at the Joint American Nuclear Society and American Society for Testing Materials Conference on Radiation Effects on Electronics, Syracuse, N. Y., 5-7 Oct 64.

Descriptors: (*Radiation damage, Electronic equipment), (*Test reactors, Reactor materials).

CONF-650406-2 Field 18I, 18K
CFSTI Prices: HC$2.00 MF$0.50

Knolls Atomic Power Lab., Schenectady, N. Y.
THE SPATIAL DEPENDENCE OF PULSED-NEUTRON REACTIVITY MEASUREMENTS,
by Martin Becker and Earl S. Quisenberry. 1964, 50p
Contract W-31-109-eng-52

Unclassified report

Presented at the Symposium on Neutron Dynamics and Control, Tucson, Ariz. 5-7 Apr 65.

Descriptors: (*Reactor reactivity, Neutron flux), (*Neutron flux, Reactor reactivity).

COO-712-88 Field 18D, 9B
CFSTI Prices: HC$3.00 MF$0.75

Chicago Univ., Ill. Labs. for Applied Sciences.
A TAPE-TO-PLOTTER CONVERTER.
by R. A. Semmler, and J. F. Tribby. Sep 64, 52p
Contract AT(11-1)-712

Unclassified report

Descriptors: (*Computer storage devices, Punched tape), (*Plotters, Data processing systems).

CVNA-222 Field 18K, 18L
CFSTI Prices: HC$2.00 MF$0.75

Westinghouse Electric Corp., Pittsburgh, Pa. Atomic Power Div.
ANALYSIS OF ZERO POWER TEMPERATURE COEFFICIENT MEASUREMENTS FOR THE CAROLINAS VIRGINIA TUBE REACTOR,
by Raymond J. Nath. Feb 65, 45p
Contract AT(30-1)-2289

Unclassified report

Descriptors: (*Temperature coefficient of reactivity, Power reactors), (*Power reactors, Temperature coefficient of reactivity).

CVNA-225 Field 18I, 18L
CFSTI Prices: HC$3.00 MF$0.75

Westinghouse Electric Corp., Pittsburgh, Pa. Atomic Power Div.
CAROLINAS VIRGINIA NUCLEAR POWER ASSOCIATES, INC., RESEARCH AND DEVELOPMENT PROGRAM.
Quarterly progress rept. Apr-Jun 64.
1964, 57p
Contract AT(30-1)-2289

Unclassified report

Descriptors: (*Reactor operation, Power reactors), (*Research program administration, Reactor operation), Reactor inspection.

CVNA-227 Field 18I, 18K
CFSTI Prices: HC$3.00 MF$0.75

Westinghouse Electric Corp., Pittsburgh, Pa. Atomic Power Div.
CVTR THERMAL-HYDRAULIC DESIGN FOR 65 MW GROSS FISSION POWER,
by R. O. Sandberg and A. A. Bishop. Feb 65, 82p
Contract AT(30-1)-2289

Unclassified report

Descriptors: (*Reactor cores, Power reactors), (*Power reactors, Reactor feasibility studies).

EURAEC-1243 Field 18J
CFSTI Prices: HC$3.00 MF$0.50

Battelle Memorial Inst., Geneva (Switzerland). International Div.
RESEARCH TO DETERMINE THE LONG-TERM MECHANICAL PROPERTIES OF METALS SUBJECTED TO MECHANICAL STRESS AT ELEVATED TEMPERATURES AND NEUTRON IRRADIATION.
Quarterly rept. no. 7,
by W. Siefgried and S. Zimering. Dec 64, 52p
Rept. no. 1968-08
Contract 100-62-12 RDS

Unclassified report

Descriptors: (*Reactor materials, Scientific research), (*Metals, Reactor materials), Creep.

EURAEC-1245 Field 18J, 11B
CFSTI Prices: HC$1.00 MF$0.50

Hahn-Meitner-Institut fuer Kernforschung, Berlin (West Germany).
RARE GAS DIFFUSION IN SOLIDS.
Quarterly rept. no. 17 for Jul - Sep 64.
Oct 64, 14p EU-B35
Proj. 114

Unclassified report

Descriptors: (*Helium group gases, Diffusion), (*Diffusion, Reactor materials), Ceramic materials, Solids.

EURAEC-1261 Field 18J
CFSTI Prices: HC$2.00 MF$0.50

Bologna Univ. (Italy).
MECHANISMS OF DIFFUSION AND PRECIPITATION OF HYDROGEN IN ZIRCONIUM. WORK-HARDENING AND RECOVERY PHENOMENA IN ZIRCONIUM.
1963, 37p EURATOM 11-1-17
Contract 051-62-11-RDI

Unclassified report

Descriptors: (*Zirconium, Deformation), (*Deformation, Zirconium), (*Hydrogen, Zirconium).

EURAEC-1268 Field 18J
CFSTI Prices: HC$1.00 MF$0.50

Battelle Memorial Inst., Geneva (Switzerland). International Div.
RESEARCH TO DETERMINE THE LONG-TERM MECHANICAL PROPERTIES OF METALS SUBJECTED TO MECHANICAL STRESS AT ELEVATED TEMPERATURES AND NEUTRON IRRADIATION.
Final rept.,
by W. Siefgried and S. Zimering. Dec 64, 11p
Rept. no. 1959-18
Contract 100-62-12 RDS

Unclassified report

Descriptors: (*Reactor materials, Scientific research), (*Metals, Reactor materials), Creep.

GEAP-4594 Field 18I
CFSTI Prices: HC$3.00 MF$0.75

General Electric Co., San Jose, Calif. Atomic Power Equipment Dept.
SOUTHWEST EXPERIMENTAL FAST OXIDE REACTOR DEVELOPMENT PROGRAM.
Quarterly rept. no. 1 Apr - Jun 1964,
by K. M. Horst. Jul 64, 63p
Contract AT04-3-540

Unclassified report

Descriptors: (*Reactor operation, Fast reactors), (*Fast reactors, Oxides).

HASL-156 Field 18H
CFSTI Prices: HC$1.75 MF$0.75

Health and Safety Lab., New York Operations Office (AEC), N. Y.
THE HASL SURFACE AIR SAMPLING PROGRAM SUMMARY REPORT FOR 1963,
by Herbert L. Volchok. 15 Jan 65, 73p

Unclassified report

Descriptors: (*Radioactivity, Air), (*Air, Radioactivity), Atmosphere.

HASL-157 Field 18H
CFSTI Prices: HC$2.00 MF$0.50

Health and Safety Lab., New York Operations Office (AEC), N. Y.
THE BOUNDARY EFFECT ON GAMMA-RAY TRANSPORT FROM A POINT SOURCE,

by Karen O'Brien and James E. McLaughlin. Jan 65, 28p
N65 19817

Unclassified report

Descriptors: (*Gamma rays, Dose rate), (*Dose rate, Gamma rays).

IDO-17073 Field 18H, 20H
CFSTI Prices: HC$1.00 MF$0.50

Phillips Petroleum Co., Idaho Falls, Idaho. Atomic Energy Div.
TERNARY FISSION OF 235 U INDUCED BY NEUTRONS OF ENERGY BELOW 1 EV,
by L. G. Miller, and M. S. Moore. Mar 65, 12p
Contract AT(10-1)-205

Unclassified report

Descriptors: (*Uranium, Fission).

IDO-28631 Field 18L
CFSTI Prices: HC$4.00 MF$1.00

Aerojet-General Nucleonics, San Ramon, Calif.
ARMY GAS-COOLED REACTOR SYSTEMS PROGRAM. SUMMARY OF NUCLEAR PHYSICS EXPERIMENTS,
by Robert E. Quilici. Jan 65, 111p
Contract AT(10-1)-880

Unclassified report

Descriptors: (*Gas-cooled reactors, Reactor system components), (*Reactor theory, Gas-cooled reactors).

IDO-28641 Field 18E
CFSTI Prices: HC$3.00 MF$0.75

Aerojet-General Nucleonics, San Ramon, Calif.
ARMY GAS-COOLED REACTOR SYSTEMS PROGRAM. Quarterly progress rept., 1 Oct-3 Dec 64.
15 Feb 65, 90p
Contract AT(10-1)-880

Unclassified report

Descriptors: (*Gas-cooled reactors, Nuclear power plants), (*Nuclear power plants, Gas-cooled reactors).

K-D-1845 Field 18J
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge Gaseous Diffusion Plant, Tenn.
UF6 CONTAINER TEST AND DEVELOPMENT PROGRAM AT THE OAK RIDGE GASEOUS DIFFUSION PLANT.
by Albert J. Mallett. 7 Jan 65, 34p CONF-650103-5
Contract W-7405-eng-26

Unclassified report

Presented at the International Symposium for Packaging and Transportation of Radioactive materials, Albuquerque, N. Mex. 12-15 Jan 65.

Descriptors: (*Containers, Uranium compounds).

KAPL-3070 Field 18I
CFSTI Prices: HC$3.00 MF$0.50

Knolls Atomic Power Lab., Schenectady, N. Y.
HYDRODYNAMIC STABILITY OF A BOILING CHANNEL. PART 4,
by A. B. Jones. 18 Aug 64, 50p
Contract W-31-109-ENG-52

Unclassified report

See also KAPL-2208 and KAPL-2290.

Descriptors: (*Boiling, Fluid dynamic properties), (*Hydrodynamics, Stability), (*Programming(Computers), Hydrodynamics.

KAPL-3074 Field 18D
CFSTI Prices: HC$2.00 MF$0.50

Knolls Atomic Power Lab., Schenectady, N. Y.
NEW LOW-ENERGY TOTAL NEUTRON CROSS-SECTION FACILITY AT KAPL--ITS CAP ABILITIES OF HANDLING RADIOACTIVE NUCLEI,
by G. D. Hickman and B. O. Hannah. 15 Nov 64, 45p
Contract W-31-109-eng-52

Unclassified report

Descriptors: (*Radioactive isotopes, Neutron cross sections), (*Neutron cross sections, Radioactive isotopes).

KAPL-3076 Field 18J
CFSTI Prices: HC$1.00 MF$0.50

Knolls Atomic Power Lab., Schenectady, N. Y.
FRACTURE TOUGHNESS OF IRRADIATED PWR HAFNIUM,
by D. F. Mowbray. 10 Sep 64, 21p
Contract W-31-109-eng-52

Unclassified report

Descriptors: (*Pressurized water reactors, Control rods), (*Control rods, Hafnium), (*Hafnium, Toughness).

KAPL-M-6413 Field 18K, 18I
CFSTI Prices: HC$3.00 MF$0.50

Knolls Atomic Power Lab., Schenectady, N. Y.
SWAKRAUM. A SPATIALLY DEPENDENT THERMAL SPECTRUM PROGRAM FOR THE PHILCO 2000,
by F. D. Federighi and T. J. Reno, Jr. 16 Oct 64, 51p KAPL-M-RPC-10
Contract W-31-109-eng-52

Unclassified report

Descriptors: (*Thermal utilization, Programming-(Computers)), (*Thermal neutrons, Programming-(Computers)), (*Programming(Computers), Thermal neutrons), (*Neutron cross sections, Programming-(Computers)).

LA-3245-MS Field 18H, 6R
CFSTI Prices: HC$2.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
BETA-GAMMA RADIOACTIVITY IN ENVIRONMENTAL AIR AT LOS ALAMOS, NEW MEXICO, FOR 1964,
by Jack W. Aeby and W. R. Kennedy. Jan 65, 22p
Contract W-7405-eng-36

Unclassified report

Descriptors: (*Air pollution, Radioactive fallout), (*Radioactive fallout, Air pollution).

LADC-6030 Field 18D
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
HEALTH PHYSICS PLANNING FOR A HIGH-PRESSURE TRITIUM GAS EXPERIMENT AT A UNIVERSITY,
by Morris J. Engelke. 1962, 16p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Tritium, Elastic scattering), (*Electron accelerators, Safety).

LA-DC-6866 Field 18J
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
PROBLEMS PERTAINING TO PACKAGING AND TRANSPORTATION REGULATORY STANDARDS APPLICABLE TO SHIPMENTS OF RADIOACTIVE MATERIALS,
by Horace E. Noyes. 1964, 10p
Rept. no. CONF-650103-1
Contract W-7405-eng-36
Unclassified report

Presented at the international symposium on packaging and transportation of radioactive material, Albuquerque, N. Mex.

Descriptors: (*Reactor fuels, Packaging).

MIT-334-12 Field 18J
CFSTI Prices: HC$2.00 MF$0.50

Massachusetts Inst. of Tech., Cambridge. Dept. of Nuclear Engineering.
IN-PILE LOOP IRRADIATION STUDIES OF ORGANIC COOLANT MATERIALS.
Progress rept. for 1 Oct 63-31 Dec 64,
by E. A. Mason. 1 Feb 65, 32p
Contract AT(38-1)-334, Proj. DSR-9819
Unclassified report

Descriptors: (*Organic cooled reactors, Reactor coolants), (*Reactor coolants, Organic cooled reactors).

MIT-2073-2 Field 18J, 9B
CFSTI Prices: HC$3.00 MF$0.50

Massachusetts Inst. of Tech., Cambridge. Dept. of Nuclear Engineering.
A COMPUTER CODE FOR FUEL CYCLE CALCULATIONS IN A SPECIAL SHIFT CONTROLLED, URANIUM FUELED REACTOR.
Progress rept.,
by Ferdinand Hofmann. Sep 64, 53p MITNE-57
Contract AT(30-1)-2073
Unclassified report

Descriptors: (*Reactor fuel processing, Programming(Computers)), (*Programming(Computers, Reactor fuel processing), Reactor control.

MIT-2073-3 Field 18J, 9B
CFSTI Prices: HC$2.00 MF$0.50

Massachusetts Inst. of Tech., Cambridge, Dept. of Nuclear engineering.
FUEL CYCLE CODE, FUELMOVE III.
Progress rept.,
by J. A. Sovka and M. Benedict. Sep 64, 42p
MITNE-58
Contract AT(30-1)-2073
Unclassified report

Descriptors: (*Reactor fuel processing, Programming-Computers)), (*Programming(Computers), Reactor fuel processing).

NAA-SR-8617 Field 18N
CFSTI Prices: HC$5.00 MF$1.00

Atomics International, Canoga Park, Calif.
SNAP TECHNOLOGY HANDBOOK. VOLUME III. REFRACTORY FUELS AND CLADDINGS,
by G. F. Burdi. 30 Apr 65, 143p Unclassified report
Contract AT(11-1)-GEN-8
Descriptors: (*Reactor fuels, Refractory materials), (*Reactor fuel cladding, Refractory metals), (*Reactor materials, Handbooks).

NAA-SR-10154 Field 18J, 18L
CFSTI Prices: HC$2.00 MF$0.50

Atomics International, Canoga Park, Calif.
ANALYSIS OF TEMPERATURE OSCILLATIONS IN THE SRE.
by C. L. Peckinpaugh. 20 Apr 65, 25p
Contract AT(11-1)-GEN-8
Unclassified report

Descriptors: (*Fused salts cooled reactors, Temperature).

NAA-SR-MEMO-10730 Field 18J
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
TANTALUM FOIL INSULATION FOR LIQUID METAL COMPONENTS OPERATING AT 1000-1400 DEGREE F, IN VACUUM.
by J. R. Crosby. 1 Dec 64, 11p Unclassified report
Contract AT(11-1)-GEN-18
Descriptors: (*Thermal insulation, Tantalum), (*Tantalum, Foils), Liquid metals.

NAA-SR-MEMO-10885 Field 18J
CFSTI Prices: HC$2.00 MF$0.50

Atomics International, Canoga Park, Calif.
EFFECT OF EXTENDED EXPOSURE TO HEATED LiH ON TENSILE PROPERTIES OF 347 AND 321 STAINLESS STEELS,
by R. S. Neymark. 7 Jan 65, 35p
Contract AT(11-1)-GEN-8
Unclassified report

Descriptors: (*Stainless steel, Tensile properties), (*Lithium compounds, Hydrides), Corrosion, High-temperature research.

NBL-216 Field 18J
CFSTI Prices: HC$4.00 MF$1.00

New Brunswick Lab. (AEC), N. J.
SEMIANNUAL PROGRESS REPORT FOR THE PERIOD JANUARY 1964 THROUGH JUNE 1964.
Mar 65, 107p
Unclassified report

Descriptors: (*Reactor fuel elements, Chemical analysis), (*Chemical analysis, Reactor materials).

NYO-2910-7 Field 18D, 20A
CFSTI Prices: HC$1.00 MF$0.50

Aeroprojects, Inc., West Chester, Pa.
APPLICATIONS OF ULTRASONIC ENERGY.
ULTRASONIC INSTRUMENTATION FOR NUCLEAR APPLICATIONS.
Bimonthly progress rept. no. 19, 1 Oct 30 Nov 64.
Dec 64, 9p
Contract AT(30-1)-2910

Unclassified report

Descriptors: (*Ultrasonic radiation, Instrumentation), (*Thermometers, Ultrasonic radiation), (*Liquid level gages, Ultrasonic radiation).

NYO-2910-8 Field 18J, 14B
CFSTI Prices: HC$1.00 MF$0.50

Aeroprojects, Inc., West Chester, Pa.
APPLICATIONS OF ULTRASONIC ENERGY.
Bimonthly progress rept. no. 20, 1 Dec 64-31 Jan 65.
Feb 65, 11p
Contract AT(30-1)-2910

Unclassified report

Descriptors: (*Ultrasonic radiation, Liquid level gages), Reactor fuel processing.

NYO-2910-9 Field 18J, 14B
CFSTI Prices: HC$1.00 MF$0.50

Aeroprojects, Inc., West Chester, Pa.
APPLICATIONS OF ULTRASONIC ENERGY.
Bimonthly progress rept. no. 21, 1 Feb-31 Mar 65.
Apr 65, 8p
Contract AT(30-1)-2910

Unclassified report

Descriptors: (*Ultrasonic radiation, Liquid level gages), Reactor fuel processing.

NYO-10221 Field 18B
CFSTI Prices: HC$2.00 MF$0.50

Parametrics, Inc., Waltham, Mass.
RADIOLOGICAL MECHANISMS FOR GEOPHYSICAL RESEARCH.
Annual rept.,
by M. Bramson and C. A. Ziegler. 31 Oct 64, 32p
Contract AT(30-1)-2983

Unclassified report

Descriptors: (*Sedimentation, Marine geology), (*Marine geology, Radioactive isotopes).

ORNL-3504 Field 18J, 18H
CFSTI Prices: HC$5.00 MF$1.25

Oak Ridge National Lab., Tenn.
IRRADIATION EFFECTS IN THE EGCR FUEL,
by C. D. Baumann. Jun 65, 191p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Reactor fuel elements, Gas-cooled reactors), (*Radiation damage, Reactor fuel elements).

ORNL-3538 Field 18J, 18N, 11F
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
SNAP-8 CORROSION PROGRAM.
Quarterly progress rept. for period ending 31 Aug 63,
by H. W. Savage, E. L. Compere, W. R. Huntley, and A. Taboada. 19 Dec 63, 42p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Liquid metal coolants, Corrosion), (*Corrosion, Reactor materials).

ORNL-3604 Field 18J, 18N, 11F
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
SNAP-8 CORROSION PROGRAM.
Quarterly progress rept. for period ending 30 Nov 63,
by H. W. Savage, E. L. Compere, R. E. MacPherson, W. R. Huntley, and A. Taboads. Mar 64, 51p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Liquid metal coolants, Corrosion), (*Reactor materials, Corrosion).

ORNL-3618 Field 18J, 18N, 11F
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
SNAP-8 CORROSION PROGRAM.
Quarterly progress rept. for period ending 29 Feb 64,
by H. W. Savage, E. L. Compere, R. E. MacPherson, W. R. Huntley, and A. Taboads. Apr 64, 40p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Liquid metal coolants, Corrosion), (*Reactor materials, Corrosion).

ORNL-3640 Field 18G
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
LABORATORY DEVELOPMENT OF PROCESSES FOR FIXATION OF HIGH-LEVEL RADIOACTIVE WASTE IN GASSY SOLIDS. 3. WASTES FROM THE PUREX SOLVENT EXTRACTION PROCESS,
by W. E. Clark, H. W. Godbee, and C. L. Gitzgerald.
Jun 65, 61p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Radioactive waste, Processing).

ORNL-3671 Field 18J, 18N, 11F
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
SNAP-8 CORROSION PROGRAM.
Quart erly progress rept. for period ending 31 May 64,
by H. W. Savage, E. L. Compere, R. E. MacPherson, W. R. Huntley, and A. Taboada. Jul 64, 35p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Liquid metal coolants, Corrosion), (*Corrosion, Reactor materials).

ORNL-3730 Field 18J, 18N, 11F
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
SNAP-8 CORROSION PROGRAM.
Quarterly progress rept. for period ending 31 Aug 64,
by H. W. Savage, E. L. Compere, R. E. MacPherson,
W. R. Huntley, and A. Taboada. Nov 64, 68p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Liquid metal coolants, Corrosion), (*Corrosion, Reactor materials).

ORNL-3759 Field 18F
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
DETERMINATION OF THERMAL-NEUTRON FLUX DISTRIBUTIONS IN THE BULK SHIELDING REACTOR II BY COPPER WIRE ACTIVATION TECHNIQUES,
by G. T. Chapman. Mar 65, 53p N65-19537
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Reactor shielding calculations, Neutron flux), (*Neutron flux, Reactor shielding calculations).

ORNL-3784 Field 18J, 18N, 11F
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
SNAP-8 CORROSION PROGRAM.
Quarterly progress rept. for period ending 30 Nov 64,
by H. W. Savage, E. L. Compere, and R. E. MacPherson.
Mar 65, 63p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Liquid metal coolants, Corrosion), (*Corrosion, Reactor materials).

ORNL-3790 Field 18J, 18N, 11F
CFSTI Prices: HC$4.00 MF$0.75

Oak Ridge National Lab., Tenn.
TYPE 316 STAINLESS STEEL, INCONEL, AND HAYNES ALLOY NO. 25 NATURAL-CIRCULATION BOILING-POTASSIUM CORROSION TEST LOOPS,
by D. H. Jansen and E. E. Hoffman. Jun 65, 101p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Liquid metal coolants, Corrosion), (*Corrosion, Reactor materials).

ORNL-3802 Field 18B
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
REVIEW OF RADIOISOTOPES PROGRAM, 1964,
by J. H. Gillette. May 65, 71p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Radioisotopes, Scientific research).

ORNL-3815 Field 18B
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn. Isotopes Development Center.
REVIEW OF ORNL THERMAL DIFFUSION PROGRAM.
Rept. for Jan-Dec 64,
by T. A. Butler, W. R. Rathkamp, and H. B. Greene.
Jun 65, 25p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Thermal diffusion, Helium group gases), (*Helium group gases, Isotope separation).

ORNL-3823 Field 18J, 18N, 11F
CFSTI Prices: HC$3.00 MF$0.50

Oak Ridge National Lab., Tenn.
SNAP-8 CORROSION PROGRAM.
Quarterly progress rept. for period ending 28 Feb 65,
by H. W. Savage, E. L. Compere, and R. E. MacPherson.
Jun 65, 43p Unclassified report
Contract W-7405-eng-26
Descriptors: (*Liquid metal coolants, Corrosion), (*Corrosion, Reactor materials).

ORNL-P-358 Field 18J
CFSTI Prices: HC$2.00 MF$0.75

Oak Ridge National Lab., Tenn.
IMPACT RESISTANCE OF FUELED GRAPHITE SPHERES FOR PEBBLE BED REACTOR APPLICATIONS,
by C. O. Smith and J. M. Robbins.
21 Aug 64, 41p Unclassified report
Contract W-7405-eng-26
Presented at the Conference on Industrial Carbon and Graphite (No. 2), London, England, Apr. 65.

Descriptors: (*Reactor fuel elements, Shock resistance), (*Shock resistance, Reactor fuel elements), Tests, Spheres, Gas-cooled reactors.

ORNL-P-786 Field 18F, 22B
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
THE VALIDITY OF THE STRAIGHTAHEAD APPROXIMATION IN SPACE VEHICLE SHIELDING STUDIES,
by R. G. Alsmiller, Jr., D. C. Irving and W. E. Kinney.
1964, 13p CONF-720-7
Contract W-7405-eng-26
Unclassified report

Presented at the Symposium on Protection Against Radiation Hazards in Space, (No. 2) Gatlinburg, Tenn., 12-14 Oct 64.

Descriptors: (*Shielding, Spacecraft), (*Spacecraft, Shielding).

ORNL-P-801 Field 18F, 22B
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
THE SECONDARY PARTICLE CONTRIBUTION TO THE DOSE FROM MONOENERGETIC PROTON BEAMS AND THE VALIDITY OF CURRENT-TO-DOSE CONVERSION FACTORS,
by D. C. Irving, R. G. Alsmiller, and W. E. Kinney.
1964, 9p CONF-720-9
Contract W-7405-eng-26 Unclassified report

Presented at the Symposium on Protection Against Radiation Hazards in Space, (no. 2) Gatlinburg, Tenn., 12-14 Oct 64.

Descriptors: (*Dose rate, Proton beams), (*Shielding, Spacecraft).

ORNL-P-869 Field 18J
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
RESULTS OF A TESTING PROGRAM FOR UNIRRADIATED FISSILE MATERIAL CONTAINERS,
by L. B. Shappert. 1963, 16p
CONF-650103-2 Unclassified report
Contract W-7405-eng-26

Descriptors: (*Reactor materials, Containers), (*Containers, Reactor materials).

ORNL-P-920 Field 18J
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
RADIOISOTOPE SHIPPING CONTAINER DEVELOPMENT,
by K. W. Haff. 30 Nov 64, 16p
CONF-650103-3
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Radioactive isotopes, Containers), (*Containers, Radioactive isotopes).

ORNL-P-1064 Field 18G
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
DISPOSAL OF HIGH-LEVEL POWER REACTOR WASTES IN A SALT MINE,
by W. J. Boegly, Jr., R. L. Bradshaw, F. M. Empson, and W. F. Schaffer, Jr. 1964, 26p
CONF-650203-3
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Radioactive waste, Disposal).

ORNL-P-1094 Field 18D, 6R
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn. Analytical Chemistry Div.
THEORETICAL AND EXPERIMENTAL ASPECTS OF QUENCHING VARIABLES FROM BIOMEDICAL SAMPLES IN LIQUID SCINTILLATOR SYSTEMS,
by Harley H. Ross. 1963, 23p CONF-650507-1; SM-61/38
Contract W-7405-eng-26
Unclassified report

For presentation at IAEA Symposium on Radioisotope Sample Measurement Techniques in Medicine and Biology, Vienna.

Descriptors: (*Scintillation counters, Radiobiology), (*Quenching(Inhibition), Scintillation counters).

ORNL-P-1109 Field 18J, 13H
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
NONDESTRUCTIVE TESTING OF IRRADIATED MATERIALS IN THE UNITED STATES,
by Robert W. McClung and Donald A. Douglas, Jr.
1965, 16p CONF-650604-1 Unclassified report
Contract W-7405-eng-26

Presented at the International Symposium on Working Methods in High Activity Hot Labs., Grenoble, France.

Descriptors: (*Reactor materials, Non-destructive testing), (*Test methods, Reactor materials).

ORNL-P-1188 Field 18J
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
NONDESTRUCTIVE TESTING TECHNIQUES FOR RESEARCH AND PROCESS CONTROL,
by D. A. Douglas, Jr., R. W. McClung, and B. E. Foster.
1965, 27p CONF-650511-1
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Non-destructive testing, Reactor fuels), (*Reactor fuels, Non-destructive testing).

ORNL-TM-431 Field 18J, 18L
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
COATED-PARTICLE FUEL DEVELOPMENT AT OAK RIDGE NATIONAL LABORATORY,
comp. by W. O. Harms. 14 Feb 63, 75p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Reactor fuels, Coatings).

ORNL-TM-842 Field 18K
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
EXTERMINATOR:-A MULTIGROUP CODE FOR SOLVING NEUTRON DIFFUSION EQUATIONS IN ONE AND TWO DIMENSIONS,
by T. B. Fowler, M. L. Tobias, and D. R. Vondy.
Feb 65, 63p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Neutron flux, Programming(Computers)), (*Programming(Computers), Neutron flux).

ORNL-TM-896 Field 18J
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn. Isotopes Development Center.
AN AIR-PULSED LABORATORY MIXER-SETTLER,
by R. E. Mchenry and J. C. Posey. Sep 64, 22p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Reactor materials, Instrumentation).

ORNL-TM-907 Field 18J
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
MSRE DESIGN AND OPERATIONS REPORT. PART VII. FUEL HANDLING AND PROCESSING PLANT,
by R. B. Lindauer. May 65, 100p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Fused salts cooled reactors, Reactor fuel processing), (*Reactor fuel processing, Fused salts cooled reactors).

ORNL-TM-937 Field 18J
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn. Chemical Technology Div.

CHEMICAL TECHNOLOGY DIVISION, UNIT OPERATIONS SECTION MONTHLY PROGRESS REPORT, MAY 1964,
by M. E. Whatley, P. A. Haas, R. W. Horton, and C. D. Watson. Nov 64, 42p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Reactor fuel processing, Instrumentation).

ORNL-TM-959 Field 18J
CFSTI Prices: HC$5.00 MF$1.00

Oak Ridge National Lab., Tenn.
ANALYSIS OF HFIR IRRADIATED FUEL ELEMENT SHIPPING CASK,
by J. H. Evans, G. H. Llewellyn, and T. W. Pickel. Jan 65, 161p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Reactor fuel elements, Containers), (*Containers, Reactor fuel elements).

ORNL-TM-984 Field 18J
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
THE REACTION OF STEAM WITH LARGE SPECIMENS OF GRAPHITE FOR THE EXPERIMENTAL GAS-COOLED REACTOR,
by R. E. Helms and F. E. MacPherson. Mar 65, 29p
Contract W-7504-eng-26

Unclassified report

Descriptors: (*Gas-cooled reactors, Graphite), (*Reactor fuel elements, Graphite).

ORNL-TM-987 Field 18F
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
DESIGN ANALYSIS OF A PURE FISSION SPECTRUM FACILITY FOR THE BULK SHIELDING REACTOR,
by G. H. Llewellyn. Jan 65, 55p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Fission neutrons, Shielding).

ORNL-TM-988 Field 18D, 6R
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
DESCRIPTION OF FACILITY RADIATION AND CONTAMINATION ALARM SYSTEMS INSTALLED IN RADIOCHEMICAL PROCESSING PILOT PLANT BUILDING 3019,
by J. A. Russell, Jr. and D. J. Knowles.
16 Mar 65, 19p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Radiation monitors, Warning systems), (*Warning systems, Radiation monitors).

ORNL-TM-993 Field 18H
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
TRANSIENTS INDUCED BY PULSED NEUTRON SOURCES IN MULTIREGION REACTORS,
by C. A. Preskitt and E. A. Nephew. Jan 65, 71p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Transients, Neutrons).

ORNL-TM-994 Field 18L, 7A
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
ESTIMATION OF INTERIM REPLACEMENT COSTS OF DUAL-PURPOSE NUCLEAR-ELECTRIC SEA WATER CONVERSION STATIONS,
by S. A. Reed and J. C. Moyers. Dec 64, 33p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Nuclear reactors, Desalination), (*Sea water, Desalination).

ORNL-TM-1001 Field 18
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn. Chemical Technology Div.
PRELIMINARY EXPERIMENTAL GAS-COOLED REACTOR SPENT FUEL SHIPPING CASK DESIGN,
by L. B. Shappert. Jan 65, 18p Unclassified report
Contract W-7405-eng-26

Descriptors: (*Gas-cooled reactors, Reactor fuels), (*Containers, Reactor fuels).

ORNL-TM-1017 Field 18J
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
TENSILE AND CREEP PROPERTIES OF INOR-8 FOR THE MOLTEN-SALT REACTOR EXPERIMENT,
by J. T. Venard. Feb 65, 20p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Reactor materials, Fused salts cooled reactors), Tensile properties, Creep.

ORNL-TM-1020 Field 18J
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn. Chemical Technology Div.
CHEMICAL TECHNOLOGY DIVISION, CHEMICAL DEVELOPMENT SECTION C PROGRESS REPORT FOR APRIL 1961 - JULY 1961,
by K. B. Brown. Dec 64, 47p Unclassified report
Contract W-7405-eng-26

Descriptors: (*Reactor fuel processing, Separation).

ORNL-TM-1024(Rev 1) Field 18J
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
CHANGES IN URANIUM ISOTOPIC COMPOSITION OF IRRADIATED THO2-UO2 FUEL SAMPLES,
by J. H. Goode. 29 Jan 65, 7p
Contract W-7405-eng-26 Unclassified report

Descriptors: (*Reactor fuels, Thorium compounds), (*Uranium, Radioactive isotopes).

ORNL-TM-1047 Field 18B
CFSTI Prices: HC$4.00 MF$1.00

Oak Ridge National Lab., Tenn. Isotopes Development Center.
RESEARCH MATERIALS COORDINATION AND PLANNING MEETING, NOVEMBER 14-15, 1963,
comp. by P. S. Baker. Apr 65, 150p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Isotope separation, Symposia), (*Radioactive isotopes, Isotope separation).

PB-168 142 Field 18F
CFSTI Prices: HC$1.00 MF$0.50

Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
THE ULTRASONIC COPPER AND BRASS DECONTAMINATION STUDY (Etude de la Decontamination du Cuivre et des Laitons en Presence d'Ultrasons),
by Jeannine Courtault, Jean de Kerdelleau, and Emile Mestre. Jul 65, 25p Rept. no. CEA-R-2823
Unclassified report

Text in French with attached summary in English.

Descriptors: (*Copper, Decontamination), (*Brass, Decontamination), (*Ultrasonic radiation, Decontamination), Fission products, Plutonium, Solutions.

The use of ultra-sonics as a decontamination technic does not bring an absolute solution. As a function of the materials it seemed necessary to find what was the optimum conditions for using the ultra-sonics and to define not only the ultra-sonic factors but also the chemical solutions which bring some appreciable decontamination factors without bringing any too important corrosion processes. This report gives the results of this study applied to copper and brass. This study allowed to select some effective treatment baths on the two types of contamination: plutonium and fission products. (Author)

SC-DC-64-1591 Field 18D, 18C
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
SANDIA AND THE VELA SATELLITE PROGRAM,
by H. H. Patterson. Oct 64, 10p CONF-797-3
Contract AT(29-1)-789
Unclassified report

Presented at American Society of Mechanical Engineers, Albuquerque, N. Mex., Oct 64.

Descriptors: (*Nuclear explosions, Monitors), (*Radiation monitors, Spaceborne).

SC-RR-65-28 Field 18J
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
REPORT ON THE CORROSION OF IRRADIATED U - 10MO ALLOY IN CO2 AND N2 AT ELEVATED TEMPERATURE,
by G. L. Eggert. Feb 65, 8p
Contract AT(29-1)-789
Unclassified report

Descriptors: (*Uranium alloys, Radiation damage), (*Molybdenum alloys, Radiation damage).

SC-TM-64-1674 Field 18D
CFSTI Prices: HC$2.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
X- AND GAMMA-RAY MONITOR,
by W. F. Windle. Nov 64, 28p Unclassified report
Contract AT(29-1)-789

Descriptors: (*Radiation monitors, Electromagnetic waves), (*X-rays, Radiation monitors), (*Gamma rays, Radiation monitors).

SC-TM-64-1742 Field 18D
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
SCINTILLATION PROBE TAIL-OFF: A PRELIMINARY INVESTIGATION,
by E. L. Jacobs. Dec 64, 11p
Contract AT(29-1)-789
Unclassified report

Descriptors: (*Scintillation counters, Relaxation time).

SRO-110 Field 18E
CFSTI Prices: HC$1.00 MF$0.50

Savannah River Operations Office (AEC), Aiken, S. C.
HEAVY WATER POWER REACTOR PROGRAM.
Monthly progress rept. for Nov 64, 1964, 5p
Unclassified report

Descriptors: (*Power reactors, Heavy waters), (*Heavy water, Power reactors).

SRO-112 Field 18E
CFSTI Prices: HC$1.00 MF$0.50

Savannah River Operations Office (AEC), Aiken, S. C.
HEAVY WATER POWER REACTOR PROGRAM.
Monthly progress rept. Unclassified report
1965, 6p

Descriptors: (*Power reactors, Heavy water), (*Heavy water, Power reactors).

SRO-114 Field 18E
CFSTI Prices: HC$1.00 MF$0.50

Savannah River Operations Office (AEC), Aiken, S. C.
HEAVY WATER POWER REACTOR PROGRAM.
Monthly progress rept. for Mar 65.
1965, 8p
Unclassified report

Descriptors: (*Power reactors, Heavy water), (*Heavy water, Power reactors).

TID-3512 (sup. 1) Field 18B, 6F
CFSTI Prices: HC$2.00 MF$0.50

Division of Technical Information Extension (AEC), Oak Ridge, Tenn.
ISOTOPE TECHNIQUES IN THE BIOLOGICAL SCIENCES. A LITERATURE SEARCH,
comp. by Helen L. Ward. May 65, 45p
Unclassified report

Descriptors: (*Radioactive isotopes, Ecology), (*Medical research, Radioactive isotopes).

TID-3535 (sup. 1) Field 18F
CFSTI Prices: HC$3.00 MF$0.75

Division of Technical Information Extension (AEC), Oak Ridge, Tenn.
RADIOACTIVE DECONTAMINATION. A LITERATURE SEARCH.,
comp. by Henry D. Raleigh. Apr 65, 82p
Unclassified report

Descriptors: (*Radioactivity, Decontamination), (*Decontamination, Radioactivity).

TID-17942 Field 18C, 6R
CFSTI Prices: HC$5.00 MF$1.00

Atomic Bomb Casualty Commission, Hiroshima (Japan).
BIBLIOGRAPHY OF PUBLICATIONS CONCERNING EFFECT OF NUCLEAR EXPLOSIONS, 1945-1960.
1963, 191p
Contract AT(49-1)-GEN-72
Unclassified report

Descriptors: (*Nuclear explosions, Radiation effects), Bibliographies.

TID-21110 Field 18K, 18I, 12A
CFSTI Prices: HC$1.00 MF$0.50

Knolls Atomic Power Lab., Schenectady, N. Y.
ITERATIVE METHODS FOR SOLUTION OF DIFFUSION PROBLEMS IN POLAR COORDINATES,
by D. B. MacMillan. 3 Sep 64, 17p
Contract W-31-109-eng-52
Unclassified report

Descriptors: (*Iterative methods, Diffusion), (*Diffusion, Neutron transport theory), (*Neutron transport theory, Diffusion).

TID-21415 Field 18J
CFSTI Prices: HC$3.00 MF$0.75

Pennsylvania State Univ., Unversity Park.
RESEARCH ON GRAPHITE.
Summary rept. 1 Apr 64-31 Mar 65,
by P. L. Walker, Jr., H. B. Palmer and W. S. Siethorn.
10 Dec 64, 64p
Contract AT(30-1)-1710
Unclassified report

Descriptors: (*Reactor materials, Graphite), (*Graphite, Scientific research).

TID-21500 Field 18E
CFSTI Prices: HC$3.00 MF$0.50

Societe d'Energie Nucleaire Franco-Belge Des Ardennes, Chooz-Lez-Givet (France).
ARDENNES NUCLEAR POWER PLANT.
Quarterly rept. no. 9, 1 Jul-30 Sep 64.
22 Oct 64, 54p
Unclassified report

Descriptors: (*Nuclear power plants, Design), (*Civil engineering, Nuclear power plants).

TID-21625 Field 18H
CFSTI Prices: HC$2.00 MF$0.50

Carnegie Inst. of Tech., Pittsburgh, Pa. Dept. of Physics.
RADIATION EFFECTS IN SOLIDS.
Rept. for 1 Apr 64-31 Mar 65.
by D. A. Wiegand and Julius Ashkin. 29 Jan 65, 26p
Contract AT(30-1)-3033
Unclassified report

Descriptors: (*Radiation damage, Solids), Metals, Ceramic materials.

TID-21633 Field 18I, 18K
CFSTI Prices: HC$1.00 MF$0.50

Rutgers -- The State Univ. of New Jersey, New Brunswick. Bureau of Engineering Research.
BASIC STUDIES IN GAS-SOLID SUSPENSION.
Quarterly rept. no. 64-2, 1 Apr-10 Oct 64,
by Richard L. Peskin. 15 Oct 64, 18p
Contract AT(30-1)-2930
Unclassified report

Descriptors: (*Reactor materials, Gases), (*Gases, Reactor materials), (*Solids, Reactor materials).

TID-21697 Field 18D, 9B
CFSTI Prices: HC$1.00 MF$0.50

Alabama Univ., University. Dept. of Physics.
COMPUTER PROGRAM FOR NUCLEAR MAGNETIC AND QUADRUPOLE RESONANCE FREQUENCIES AND INTENSITIES, I EQUAL 3/2 TO 9,
by Edward H. Carlson. 1 Feb 65, 14p
Contract AT(40-1)-3090
Unclassified report

Descriptors: (*Programming(Computers), Nuclear physics), (*Nuclear physics, Programming(Computers)).

UCRL-6999 (Rev 2) Field 18C
CFSTI Prices: HC$2.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
CRATERING AND RADIOACTIVITY RESULTS FROM A NUCLEAR CRATERING DETONATION IN BASALT,
by M. D. Nordyke and W. Wrya. 10 Oct 63, 37p
Contract W-7405-eng-48
Unclassified report

Descriptors: (*Nuclear explosions, Cratering), (*Radioactive fallout, Nuclear explosions).

UCRL-7787 Field 18C
CFSTI Prices: HC$3.00 MF$0.75

Lawrence Radiation Lab., Univ. of California, Livermore.
NUCLEAR EXPLOSION CRATERS, ASTROBLEMES, AND CRYPTOEXPLOSION STRUCTURES,
by Nicholas M. Short. 24 Mar 64, 75p
Contract W-7405-eng-48
Unclassified report

Descriptors: (*Nuclear explosions, Cratering), (*Cratering, Nuclear explosions).

UCRL-11251 Field 18J, 20C
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Berkeley.
ELECTROMAGNETIC PROPERTY MEASUREMENTS,
by Ira Pratt. Mar 64, 13p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Reactor materials, Electromagnetic properties), (*Electromagnetic properties, Reactor materials).

UCRL-11902 Field 18H, 7E
CFSTI Prices: HC$2.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Berkeley.
THE PROMPT GAMMA RAY, PROMPT ELECTRON AND PROMPT X-RAY SPECTRA ASSOCIATED WITH FISSION FRAGMENTS OF SPECIFIC MASS,
by Harry R. Bowman, Stanley G. Thompson, and Rand L. Watson. 27 Jan 65, 27p CONF-650301-5
Contract W-7405-eng-48

Unclassified report

Presented at the Symposium on the Physics and Chemistry of Fission, Salzburg, Austria.

Descriptors: (*Fission products, Californium), (*Californium, Fission products), (*Gamma-ray spectra, Fission products), (*X-ray spectrum, Fission products).

UCRL-12005 Field 18F, 9B
CFSTI Prices: HC$5.00 MF$1.00

Lawrence Radiation Lab., Univ. of California, Livermore.
YOGI-G: A GAMMA-RAY MONTE CARLO PROGRAM,
by Simon Kellman. 4 Aug 64, 159p
Contract W-7405-eng-48
N64 33239

Unclassified report

Descriptors: (*Reactor shielding calculations, Gamma rays), (*Programming(Computers), Monte Carlo method).

UCRL-12118 Field 18C
CFSTI Prices: HC$4.00 MF$1.00

Lawrence Radiation Lab., Univ. of California, Livermore.
PROJECT ROWBOAT.
Summary rept.,
by Bruce Myers. 5 Oct 64, 123p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Nuclear explosions, Deserts), (*Cratering, Deserts).

UCRL-12200 Field 18K, 18J
CFSTI Prices: HC$2.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
STUDY OF SOLID-MODERATED ENRICHED URANIUM EPITHERMAL SYSTEMS BY USE OF THE PULSED NEUTRON TECHNIQUE,
by John R. Morton, III. 18 Nov 64, 38p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Reactor moderators, Neutron reactions), (*Enriched fuel reactors, Reactor moderators).

UCRL-14174 Field 18J, 11C
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
RECONDITIONING OF PLASTIC-COATED FUEL ELEMENTS,
by Donald Freitas. May 65, 13p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Reactor fuel elements, Plastic coatings), (*Plastic coatings, Reactor fuel processing).

UCRL-12124-T Field 18H
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
INFORMATION INTEGRATION SYSTEM FOR LRL-L PROGRAM OF MAN-MADE RADIATION IN THE BIOSPHERE,
by Arthur R. Tamplin and Jason L. Minkler.
1964, 20p CONF-765-4
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Radioactive fallout, Documentation), (*Documentation, Radioactive fallout), (*Information retrieval, Radioactive fallout).

UCRL-12165-T Field 18H
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
THE LRL PARTICLE ANALYSIS PROGRAM,
by Robert E. Heft and James S. Kahn. 1 Nov 64, 13p
CONF-765-9
Contract W-7405-eng-48

Unclassified report

Presented at the Conference on Radioactive Fallout From Nuclear Weapons Tests, No. 2, Germantown, Md., Nov. 1964.

Descriptors: (*Radioactive fallout, Nuclei), (*Nuclei, Radioactive fallout).

UCRL-12401-T Field 18D
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
GAMMA RADIATION MONITORING RADIO TELEMETRY SYSTEM,
J. G. Nish, P. L. Phelps, and G. Holladay. 1962, 24p
CONF-650404-1
Contract W-7405-eng-48

Unclassified report

Presented at the National Telemetering Conference, Houston.

Descriptors: (*Gamma rays, Radiation monitors), (*Telemeter systems, Gamma rays).

UCRL-PUB-49 Field 18H, 5A, 14B
CFSTI Prices: HC$3.00 MF$0.75

Lawrence Radiation Lab., Univ. of California, Berkeley.
INTERIM STATUS REPORT: FISCAL YEAR 1964.
1964, 60p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Nuclear physics laboratories, Research program administration), (*Electromagnetic waves, Scientific research), (*Radiochemistry, Scientific research).

WAPD-TM-494 Field 18D, 9B
CFSTI Prices: HC$1.00 MF$0.50

Bettis Atomic Power Lab., Pittsburgh, Pa.
M0564, A FORTRAN PROGRAM FOR SYMMETRIC AND ASYMMETRIC RESONANCE INTEGRALS,
by D. R. Harris and G. J. Peters. Nov 64, 13p
Contract AT(11-1)-GEN-14
Unclassified report

Descriptors: (*Programming(Computers), Nuclear physics), (*Nuclear physics, Programming(Computers)).

WCAP-2056 (pt 5) Field 18K, 20M
CFSTI Prices: HC$3.00 MF$0.75

Westinghouse Electric Corp., Pittsburgh, Pa. Atomic Power Div.
HIGH TEMPERATURE SUPERCRITICAL PRESSURE WATER LOOP. PART V. FORCED CONVECTION HEAT TRANSFER TO WATER AFTER THE CRITICAL HEAT FLUX AT HIGH SUBCRITICAL PRESSURES.
Research and development rept.,
by A. A. Bishop, R. O. Sandberg, and L. S. Tong.
Dec 64, 66p Unclassified report
Contract AT(30-1)-2948

Descriptors: (*Heat transfer, Pressurized water reactors), (*Reactor control, Heat transfer).

WCAP-2703 Field 18F, 18K
CFSTI Prices: HC$2.00 MF$0.50

Westinghouse Electric Corp., Pittsburgh, Pa. Atomic Power Div.
1000 MWE SUPERCRITICAL PRESSURE NUCLEAR REACTOR PLANT STUDY.
Quarterly progress rept. no. 11, 1 Jul-30 Sep 64,
comp. by H. B. Kellogg. Nov 64, 50p
Contract AT(30-1)-2948
Unclassified report

Descriptors: (*Reactor fuel cladding, Corrosion), (*Heat transfer, Reactor control).

WCAP-3269-25 Field 18K, 9B
CFSTI Prices: HC$2.00 MF$0.75

Westinghouse Electric Corp., Pittsburgh, Pa. Atomic Power Div.
CALCULATION OF LATTICE PARAMETERS AND CRITICALITY FOR UNIFORM WATER MODERATED LATTICES,
by L. E. Strawbridge. Sep 63, 57p Unclassified report
Contract AT(30-1)-3269

Descriptors: (*Reactor lattice parameters, Programming(Computers)), (*Critical assemblies, Programming(Computers)).

WCAP-3269-28 Field 18K, 18L
CFSTI Prices: HC$2.00 MF$0.50

Westinghouse Electric Corp., Pittsburgh, Pa. Atomic Power Div.
SAXTON KINETIC EXPERIMENTS,
by V. Rajagopal. Jun 64, 45p
Contract AT(30-1)-3269 Unclassified report

Descriptors: (*Reactor kinetics, Power reactors), (*Power reactors, Reactor kinetics).

WCAP-3269-29 Field 18J, 18H, 11F
CFSTI Prices: HC$2.00 MF$0.50

Westinghouse Electric Corp., Pittsburgh, Pa. Atomic Power Div.
METALLURGICAL EVALUATION OF SILVER - INDIUM - CADMIUM CONTROL ROD ALLOYS,
by W. R. Smalley and D. B. Scott. Aug 64, 36p
Contract AT(30-1)-3269
Unclassified report

Descriptors: (*Control rods, Alloys), (*Radiation damage, Control rods), Metallurgy.

WCAP-3728 Field 18I
CFSTI Prices: HC$2.00 MF$0.50

Westinghouse Electric Corp., Pittsburgh, Pa. Atomic Power Div.
LARGE CLOSED-CYCLE WATER REACTOR RESEARCH AND DEVELOPMENT PROGRAM. SUMMARY REPORT OF DESCRIPTIONS OF TOPICAL REPORTS.
Sep 64, 46p
Contract AT(30-1)-3064
Unclassified report

Descriptors: (*Reactor operation, Pressurized water reactors).

WCAP-3736 (vol. 1) Field 18K
CFSTI Prices: HC$3.00 MF$0.75

Westinghouse Electric Corp., Pittsburgh, Pa. Atomic Power Div.
DNB (BURNOUT) STUDIES IN AN OPEN LATTICE CORE. VOLUME I,
by L. S. Tong, H. B. Currin, and F. C. Engel.
Aug 64, 94p Unclassified report
Contract AT(30-1)-3064

Descriptors: (*Reactor cores, Heat transfer), (*Heat transfer, Reactor cores).

WCAP-5496 Field 18K
CFSTI Prices: HC$1.00 MF$0.50

Westinghouse Electric Corp., Pittsburgh, Pa. Atomic Power Div.
MEASUREMENT OF LOCAL KINETIC PARAMETERS IN THE SAXTON REACTOR,
by V. Rajagopal and G. E. Swen. 1964, 25p
Rept. no. CONF-650406-1 Unclassified report
Contract AT(30-1)-3269

Descriptors: (*Reactor kinetics, Neutron transport theory), (*Reactor control, Reactor kinetics).

WCAP-6065 Field 18H
CFSTI Prices: HC$1.00 MF$0.50

Westinghouse Electric Corp., Pittsburgh, Pa. Atomic Power Div.
MELTING POINT OF IRRADIATED URANIUM DIOXIDE,
by J. A. Christensen, R. J. Allio, and A. Biancheria.
Feb 65, 19p
Contract AT(30-1)-3017 Unclassified report
N65-19820

Descriptors: (*Radiation damage, Melting), (*Uranium compounds, Dioxides).

19. Ordnance

AD-452 838 Field 19E, 20E
CFSTI Price: HC$2.00

Harry Diamond Labs., Washington, D. C.
RANGEMETER FOR XM23 LASER RANGEFINDER MODEL II,
by Ira R. Marcus. 16 Nov 64, 47p Rept. no. TR-1262
Projs. DA1C542709D6030, HDL45700
Unclassified report

Descriptors: (*Lasers, Range finding), (*Range finding, Lasers), (*Time interval counters, Range finding), Digital systems, High frequency, Transistors, Electroluminescence, Display systems.

A modified rangemeter, designated model II, was constructed and determined capable for use with the XM23 Laser Rangefinder. The model II design is a high-speed, miniature, digital time-interval counter that displays range readings from 200 to 19,995 meters when coupled to the rangefinder. This range capability is twice that of the model I rangemeter. Another advantage of the model II design is that it includes a target counter, thus allowing the operator to range on any one of five target echoes. Operation of the rangemeter is based on start and stop pulses that are received from the rangefinder. The counter then computes and displays the range to the nearest 5 + or - 5 m on a solid-state electroluminescent readout. The readout assembly is optically coupled between the computing circuits and a photoconductive readout matrix. The rangemeter system operates from -55 to +75 degrees C with a 5- to 7-v supply. The time base is a 29.971-Mc crystal oscillator; the computing circuits are high-frequency flip-flops. (Author)

20. Physics

AD-451 409 Field 20I
CFSTI Price: HC$4.00

Northwestern Univ., Evanston, Ill. Gas Dynamics Lab.
AN EXPERIMENTAL STUDY OF RADIANT ENERGY TRANSFER FROM A PLASMA,
by James M. Berry and Richard S. Tankin. Nov 64, 145p
Contract AF40 600 972
AEDC TDR-64-233
Unclassified report

Descriptors: (*Plasma jets, Thermal radiation), (*Heat transfer, Plasma jets), Bolometers, Thermistors, Mathematical models, Argon, Nitrogen, Electron transitions, Reaction kinetics, Thermodynamics, Atmosphere, Bremsstrahlung, Recombination reactions.

A thermistor bolometer has been used to determine the radiant energy transfer from a typical laboratory plasma. Radiation has been found to be a significant mechanism of energy transfer from an atmospheric argon plasma jet, amounting to as much as 18 percent of the net power input to the plasma. The radiative power density in an atmospheric argon plasma has been determined. Contributions from both bresstrahlung and recombination radiation have been found to be important. A model, based on the Kramers and the Unsold approximations, has been used to predict the radiative power density in an atmospheric argon plasma. (Author)

AD-453 419 Field 20G, 20I, 1A, 14B
CFSTI Price: HC$2.00

Arnold Engineering Development Center, Arnold Air Force Station, Tenn.
GENERAL CONSIDERATIONS OF MHD ACCELERATION FOR AERODYNAMIC TESTING.
Technical documentary rept.,
by Leon E. Ring. Dec 64, 46p Rept. no. AEDC-TDR-64-256
Contract AF40 600 1000
Unclassified report

Presented at the AGARD Specialists' Meeting on 'Arc Heaters and MHD Accelerators for Aerodynamic Purposes,' 21-23 September 1964, Rhode-Saint-Genese, Belgium.

Descriptors: (*Partial accelerators, Magnetohydrodynamics), (*Aerodynamic characteristics, Tests), Simulation, Hall effect, Traveling-wave electron accelerators, Electrostatic accelerators, Hypersonic characteristics, Correlation techniques, Velocity.

Estimates of magnetohydrodynamic (MHD) accelerator performance limitations show that velocities of 30,000 to 40,000 ft/sec at high density should be attainable with a Faraday accelerator. Operation near atmospheric pressure using seeded air is suggested; order of magnitude estimates indicate the seed material should not affect most aerodynamic testing. The possibility of increased performance by using nonequilibrium electrical conductivity is discussed. (Author)

ANL-6937 Field 20I
CFSTI Prices: HC$2.00 MF$0.50

Argonne National Lab., Ill.
A STUDY OF UNSTEADY MAGNETOHYDRODYNAMIC FLOW AND HEAT TRANSFER,
by Ralph M. Singer. Nov 64, 37p Unclassified report
Contract W-31-109-eng-38
Descriptors: (*Magnetohydrodynamics, Heat transfer).

ANL-6970 Field 20H, 12A
CFSTI Prices: HC$3.00 MF$0.50

Argonne National Lab., Ill.
THE GENERALIZED RIEMANN ZETA FUNCTIONS AND THEIR APPLICATIONS IN THE CALCULATIONS OF NEUTRON CROSS SECTIONS,
by M. Atoji and F. L. Clark. Dec 64, 53p
Contract W-31-109-eng-38
Unclassified report

Descriptors: (*Neutron cross sections, Special functions(Mathematical)), (*Special functions-(Mathematical), Neutron cross sections).

ANL-6978 Field 20H, 9B
CFSTI Prices: HC$2.00 MF$0.50

Argonne National Lab., Ill.
NEARREX, A COMPUTER CODE FOR NUCLEAR REACTION CALCULATIONS,
by P. A. Moldauer, C. A. Engelbrecht, and G. J. Duffy. Dec 64, 40p
Contract W-31-109-eng-38
Unclassified report

Descriptors: (*Nuclear reactions, Programming-(Computers)), (*Programming(Computers), Nuclear reactions).

ANL-6989 Field 20H, 20J
CFSTI Prices: HC$2.00 MF$0.50

Argonne National Lab., Ill.
INSIDE QUANTUM FIELD THEORY AND LECTURES ON NEUTRINO INTERACTIONS,
by Frank Chilton. Dec 64, 32p
Contract W-31-109-eng-38

Unclassified report

Descriptors: (*Neutrinos, Quantum mechanics), (*Field theory, Neutrinos).

BNL-918 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
LEAST SQUARES ANALYSIS OF THE 2200 M/SEC PARAMETERS OF U 233, U 235, AND PU 239.
Final rept.,
by Rudolph Sher and Joan Felberbaum. Mar 65, 11p
EANDC(US)-75
Contract AT(30-2)-GEN-16

Unclassified report

Descriptors: (*Uranium, Neutron cross sections), (*Plutonium, Neutron cross sections).

BNL-7664-R Field 20D, 20M
CFSTI Prices: HC$2.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
HEAT TRANSFER TO LIQUID METALS FLOWING PAST SPHERES AND ELLIPTICAL-ROD BUNDLES,
by Chia-Jung Hsu. Feb 64, 44p
Contract AT(30-2)-GEN-16

Unclassified report

Submitted to International Journal of Heat and Mass Transfer.

Descriptors: (*Heat transfer, Liquid metals), (*Liquid metals, Transport properties).

BNL-8802 Field 20H, 18M
CFSTI Prices: HC$2.00 MF$0.75

Brookhaven National Lab., Upton, N. Y.
EXPERIMENTAL EQUIPMENT AND METHODS FOR INELASTIC NEUTRON SCATTERING MEASUREMENTS,
by H. Palevsky. Dec 64, 50p
CONF-804-25
Contract AT(30-2)-GEN-16

Unclassified report

Presented at the IAEA Symposium on the Inelastic Scattering of Neutrons, Bombay, India 15-19 Dec 64.

Descriptors: (*Inelastic scattering, Neutrons), (*Research reactors, Reactor system components).

BNWL-31 Field 20D, 1A
CFSTI Prices: HC$3.00 MF$0.75

Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
FLOW VISUALIZATION: A COMPARISON OF STREAMING BIREFRINGENCE WITH OTHER TECHNIQUES,
by D. H. White. Mar 65, 88p
Contract AT(45-1)-1350 Unclassified report
N65 19832

Descriptors: (*Flow visualization, Refraction), (*Refraction, Flow visualization).

CALT-221-5 Field 20B, 20C
CFSTI Prices: HC$2.00 MF$0.50

Keck (W.M.) Lab. of Engineering Materials, Calif. Inst. of Tech., Pasadena.
EXPLANATION OF THE VO 2 DISTORTED RUTILE CRYSTAL STRUCTURE AND PREDICT ION OF THE MAGNETIC STRUCTURE.
Research and development rept. no. 30,
by William A. Goddard. Nov 64, 36p
Contract AT(04-3)-221

Unclassified report

Descriptors: (*Crystal structure, Vanadium compounds), (*Vanadium compounds, Oxides), Magnetic properties.

CAR-882-9 Field 20H
CFSTI Prices: HC$3.00 MF$0.75

Carnegie Inst. of Tech., Pittsburgh, Pa. Dept. of Physics.
STUDY OF THE DEPOLARIZATION OF NEGATIVE MUONS IN LIQUID HELIUM.
Doctoral thesis,
by John Kane. May 64, 79p
Contract AT(30-1)-882

Unclassified report

Descriptors: (*Muons, Helium), (*Nuclear reactions, Muons), Liquefied gases.

CEAL-1013 Field 20G
CFSTI Prices: HC$2.00 MF$0.50

Cambridge Electron Accelerator, Mass.
VACUUM DESIGN PROBLEMS OF HIGH CURRENT ELECTRON STORAGE RINGS,
by G. E. Fischer, and R. A. Mack. 23 Oct 64, 35p

Unclassified report

Descriptors: (*Electron accelerators, Vacuum apparatus), (*Vacuum apparatus, Electron accelerators).

CEAL-1020 Field 20G
CFSTI Prices: HC$1.00 MF$0.50

Cambridge Electron Accelerator, Mass.
BEAM BUMP METHOD OF TARGET ENGAGEMENT,
by R. J. Averill. 23 Apr 65, 16p
Contract AT(30-1)-2076

Unclassified report

Descriptors: (*Particle accelerator targets, Electron accelerators), (*Electron beams, Distortion), Synchrotrons.

CONF-651-44 Field 20L
CFSTI Prices: HC$1.00 MF$0.50

Louisiana State Univ., Baton Rouge.
MAGNETOTHERMAL EFFECTS IN TYPE II SUPERCONDUCTORS,
by N. H. Zebouni, A. Venkataram, and G. N. Rao. 1964, 10p
Contract AT(40-1)-3087

Unclassified report

Presented at 9th international conference on low temperature physics, Columbus, Ohio, 31 Aug-4 Sep 64.

Descriptors: (*Superconductors, Magnetic properties).

COO-264-215 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Enrico Fermi Inst. for Nuclear Studies, Univ. of Chicago, Ill.
SU(3) SYMMETRY IN THE STRONG COUPLING LIMIT.
Preliminary rept.,
by G. Wentzel. 1963, 11p EFINS-64-33
Contract AT(11-1)-264
Unclassified report

Descriptors: (*Nuclear structure, Mesons), Nuclear isobars.

COO-1197-9 Field 20L
CFSTI Prices: HC$3.00 MF$0.75

Kansas Univ., Lawrence. Dept. of Physics and Astronomy.
SELF DIFFUSION OF THE SODIUM ION IN PURE SODIUM CHLORIDE,
by Harry L. Downing, Jr. Jun 64, 64p
Technical rept. no. TR-COO-1197-9
Contract AT(11-1)-1197
Unclassified report

Descriptors: (*Chlorides, Crystal lattice defects), (*Crystal lattice defects, Diffusion).

COO-1197-10 Field 20L
CFSTI Prices: HC$3.00 MF$0.75

Kansas Univ., Lawrence. Dept. of Physics and Astronomy.
POLARIZED ABSORPTION MEASUREMENTS OF SODIUM CHLORIDE WITH CALCIUM IMPURITY,
by Dennis E. Lauer. Aug 64, 63p
Technical rept. no. TR-COO-1197-10
Contract AT(11-1)-1197
Unclassified report

Descriptors: (*Chlorides, Crystal lattice defects), (*Crystal lattice defects, Chlorides).

COO-1197-11 Field 20L
CFSTI Prices: HC$5.00 MF$1.00

Kansas Univ., Lawrence. Dept. of Physics and Astronomy.
WAVE FUNCTION CALCULATIONS OF F CENTERS IN NACL, KCL AND NAF.
Thesis,
by Juergen K. Kuebler. Dec 64, 191p
Technical rept. TR-COO-1197-11
Contract AT(11-1)-1197
Unclassified report

Descriptors: (*Halides, Crystal lattice defects).

COO-1233-18 Field 20I, 18A
CFSTI Prices: HC$1.00 MF$0.50

Wisconsin Univ., Madison. Dept. of Physics.
THERMONUCLEAR PLASMA STUDIES.
Quarterly status rept. no. 7.
31 Oct 64, 11p
Contract AT(11-1)-1233
Unclassified report

Descriptors: (*Plasma physics, Thermonuclear reactions), (*Thermonuclear reactions, Plasma physics).

FSU-2690-14 Field 20H, 20I
CFSTI Prices: HC$3.00 MF$0.50

Florida State Univ., Tallahassee. Dept. of Chemistry.
ELECTRON IMPACT STUDIES ON SIMPLE GASEOUS MOLECULES.
Bulletin no. 14.
1 May 64, 55p
Contract AT(40-1)-2690
Unclassified report

Descriptors: (*Electron bombardment, Plasma physics), (*Plasma physics, Electron bombardment).

LA-3126-MS Field 20H, 20G
CFSTI Prices: HC$2.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
PION-NUCLEON ELASTIC SCATTERING EXPERIMENTS WITH HIGH INTENSITY MESON BEAMS,
by Nelson Jarmie. Aug 64, 29p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Elastic scattering, Elementary particles), (*Elementary particles, Elastic scattering).

LA-3129 Field 20N, 18C
CFSTI Prices: HC$3.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
RADAR ATTENUATION DUE TO DELAYED GAMMA RAYS FROM HIGH ALTITUDE NUCLEAR EXPLOSIONS,
by R. C. Mjolsness and A. G. Petschek. Jul 64, 54p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Radar interference, Nuclear explosions), (*Nuclear explosions, Radar interference).

LA-3171-MS Field 20H
CFSTI Prices: HC$2.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
EXPERIMENTS ON THE REACTION PI + N YIELDS PI + PI + N AT THE PROPOSED LOS ALAMOS MESON PHYSICS FACILITY,
Lewis Agnew. 1 Sep 64, 27p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Mesons, Nuclear physics laboratories), (*Pions, Nuclear reactions).

LA-3259 Field 20B, 9B
CFSTI Prices: HC$4.00 MF$0.75

Los Alamos Scientific Lab., Univ. of California, N. Mex.
AN INTEGRATED SERIES OF CRYSTALLOGRAPHIC COMPUTER PROGRAM. V. GENERAL LEAST SQUARES REFINEMENT,
by Don T. Cromer, R. B. Roof, Jr. and Allan C. Larson.
Sep 64, 111p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Programming(Computers), Crystallography), (*Crystallography, Programming(Computers)).

LA-3267 Field 20H
CFSTI Prices: HC$2.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
GAMLEG: A FORTRAN CODE TO PRODUCE MULTI-GROUP CROSS SECTIONS FOR PHOTON TRANSPORT CALCULATIONS.
by K. D. Lathrop. 11 Mar 65, 32p
Contract W-7405-eng-36

Unclassified report

Descriptors: (*Photons, Nuclear cross sections), (*Programming(Computers), Photons).

LADC-6291 Field 20H, 12A
CFSTI Prices: HC$2.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
LOCALIZED GREENS FUNCTIONS AND INDEPENDENT-PARTICLE APPROXIMATIONS FOR BOUND SYSTEMS,
by M. Bolsterli. 1962, 28p
Contract W-7405-eng-36

Unclassified report

Descriptors: (*Green's function, Nuclear shell models), (*Nuclear shell models, Green's function).

LA-DC-6665 Field 20D
CFSTI Prices: HC$2.00 MF$0.75

Wisconsin Univ., Madison. Dept. of Chemical Engineering.
AXIAL, LAMINAR FLOW OF A NON-NEWTONIAN FLUID IN AN ANNULUS,
by Donald W. McEachern. 25 Sep 64, 49p
Contract W-7405-eng-36

Unclassified report

Descriptors: (*Laminar flow, Annular nozzles), (*Axially symmetric flow, Laminar flow).

NBS-8481 Field 20C
CFSTI Prices: HC$4.00 MF$0.75

National Bureau of Standards, Bounder, Colo.
CRYOGENIC ALUMINUM ELECTROMAGNET.
Final rept.,
by Jesse Hord. 2 Nov 64, 104p

Unclassified report

Report on Project Sherwood.

Descriptors: (*Electromagnets, Cryogenics), (*Aluminum, Electromagnets).

NYO-1480-3 Field 20K, 12A
CFSTI Prices: HC$3.00 MF$0.75

AEC Computing and Applied Mathematics Center, New York Univ., N. Y.
MONTE CARLO STUDIES OF SYSTEMS OF HARD SPHERES,
by Aubey Rotenberg. 1 Oct 64, 71p
Contract AT(30-1)-1480

Unclassified report

Descriptors: (*Monte Carlo method, Phase studies), (*Phase studies, Monte Carlo method).

NYO-3304-2 Field 20M, 20D
CFSTI Prices: HC$3.00 MF$0.75

Dynatech Corp., Cambridge, Mass.
INVESTIGATION OF TWO-PHASE FLOW AND BURNOUT.
Quarterly progress rept. 15 Jun-15 Sep 64,
by M. Suo, P. Goldberg, and A. Bergles. 30 Sep 64, 62p
Rept. no. 497

Unclassified report

Descriptors: (*Fluid flow, Heat transfer), (*Heat transfer, Fluid flow).

ORNL-3506 Field 20H
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
SPECTRA OF GAMMA RAYS PRODUCED BY THE INTERACTION OF APPROX 160-MEV PROTONS WITH BE, C, O, AL, CO, AND BI,
by W. Zobel, F. C. Maienschein, and R. J. Scroggs.
Apr 65, 75p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Gamma-ray spectra, Proton reactions), (*Protons reactions, Gamma-ray spectra), (*Gamma-proton reactions, Gamma-ray spectra).

ORNL-3734 Field 20G
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
NUCLEON-MESON CASCADE CALCULATIONS TRANSVERSE SHIELDING FOR A 45-GEV ELECTRON ACCELERATOR,
by R. G. Alsmiller, Jr., F. S. Alsmiller, and J. Barish.
Mar 65, 15p N65-19545
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Electron accelerators, Shielding), (*Shielding, Electron accelerators).

ORNL-3758 Field 20C, 3B
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
DYNAMICS OF CYLINDRICAL ELECTROMAGNETIC UNIVERSES,
by M. A. Melvin. Apr 65, 46p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Electromagnetism, Astrophysics), (*Astrophysics, Electromagnetism).

ORNL-3813 Field 20H
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
CROSS SECTIONS FOR ATOMIC DISPLACEMENT IN SOLIDS BY FAST ELECTRONS,
by O. S. Oen. May 65, 54p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Radiation damage, Solids), (*Elastic scattering, Electrons).

ORNL-P-788 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
PARTICLES EMITTED IN THE FORWARD DIRECTION FROM HIGH-ENERGY NUCLEON-NUCLEUS KNOCK-ON REACTIONS,
by H. W. Bertini. 1963, 16p CONF-720-6
Contract W-7405-eng-26
Unclassified report

Presented at the Symposium on Protection against Radiation Hazards in Space, (No. 2) Gatlinburg, Tenn., 12-14 Oct 64.

Descriptors: (*Nuclear reactions, Nuclear particles), (*Nucleons, Nuclear reactions).

ORNL-P-813 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
SPECTRA OF GAMMA RAYS PRODUCED BY INTERACTION OF APPROX 160 MEV PROTONS,
by W. Zobel, F. C. Maienschein, and R. J. Scroggs. 1963, 20p CONF-720-10
Contract W-7405-eng-26
Unclassified report

Presented at the Symposium on Protection Against Radiation Hazards In Space, (No. 2) Gatlinburg, Tenn., 12-14 Oct 64.

Descriptors: (*Gamma-ray spectra, Proton reactions), (*Proton reactions, Gamma-ray spectra), (*Gamma-proton reactions, Gamma-ray spectra).

ORNL-P-1092 Field 20H
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
MEASUREMENTS AND CALCULATIONS OF ENERGY AND ANGULAR DETAILS OF FAST NEUTRON FLUX IN WATER FROM A POOL-TYPE REACTOR,
by V. V. Verbinski and M. S. Bokhari. 1963, 41p CONF-654-54
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Neutron flux, Mathematical analysis).

ORNL-TM-196 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
EVAP:-A FORTRAN PROGRAM FOR CALCULATING THE EVAPORATION OF VARIOUS PARTICLES FROM EXCITED COMPOUND NUCLEI,
by Lawrence Dresner. 11 Apr 62, 13p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Nuclear particles, Excitation), (*Programming(Computers), Nuclear particles).

ORNL-TM-971 Field 20H
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
STATISTICAL-MODEL CALCULATIONS OF DIFFERENTIAL CROSS SECTIONS FOR TWO HEAVY-ION INDUCED REACTIONS,
by H. F. Bowsher. 1965, 27p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Nuclear reactions, Differential cross section).

ORNL-TM-1033 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
ANGULAR MOMENTUM CALCULATION FROM INTRA-NUCLEAR CASCADES,
by H. W. Bertini. 19 Feb 65, 4p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Nuclear moments, Nuclear reactions), (*Nuclear reactions, Nuclear moments).

ORNL-TM-1083 Field 20C, 20L
CFSTI Prices: HC$2.00 MF$0.75

Oak Ridge National Lab., Tenn.
EXPERIMENTAL SIMULATION OF LARGE, HIGH FIELD, SUPERCONDUCTING MAGNET OPERATION.
Summary rept. 1 Jul 64-28 Feb 65,
by W. F. Gauster and D. L. Coffey. 23 Mar 65, 46p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Magnets, Superconductors).

ORNL-TM-1093 Field 20D, 1A
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
A COMPUTER PROGRAM FOR FLOW CALCULATIONS,
by E. G. Davisson. 3 Feb 65, 37p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Fluid flow, Programming(Computers)), (*Programming(Computers), Fluid flow).

Patent 3,194,293 Field 20F

SHOCK ABSORBING CASTER WHEEL.
Patent assigned to AEC,
by Robert J. Kindley. 13 Jul 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.25

Descriptors: (*Vibration isolators, Vehicle wheels), (*Vehicle wheels, Vibration isolators), Rubber, Tires, Deformation, Shock(Mechanics), Patents.

The caster wheel assembly has a rubber-like tire which is capable of stretching and deforming in shear to provide shock absorption. The tire has an annular ring of metal for distributing loads more uniformly through the wheel and tire.

PB-168 012 Field 20H
CFSTI Prices: HC$4.00 MF$0.75

Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.

CALCULATION OF THE ENERGY OF PARTICLES EMITTED IN THE REACTIONS 3T(d,n)2He4,D(d,n)2He3 and D(D,p)T (Calcul de l'Energie des Particules Emises par les Reactions 3T(d,n)2He4, D(d,n)2He3 et D(d,p)T),
by Michel Oria and Andre Sorriaux. 1965, 107p
Rept. no. CEA-R-2779

Unclassified report

Text in French, attached summary in English.

Descriptors: (*Nuclear reactions, Energy), Deuteron reactions, Neutron reactions, Proton reactions, Tritium, Deuterium, Helium, Electrostatic accelerators, France.

PB-168 141 Field 20H
CFSTI Prices: HC$3.00 MF$0.75

Commissariat a l'Energie Atomique, Grenoble (France). Centre d'Etudes Nucleaires.
CONTRIBUTION TO THE STUDY OF (d,p) AND (d, alpha REACTIONS ON 16O AND 11B FROM 200 keV TO 1 MeV) (Contribution a l'Etude des Reactions (d,p) et (d, alpha Sur 16O et 11B de 200 keV a 1 MeV).
Doctoral thesis,
by Nicole Longequeue. 1965, 57p
Rept. no. CEA-R-2807

Unclassified report

Text in French with attached summary in English.

Descriptors: (*Nuclear reactions, Nuclear energy levels), Oxygen, Boron, Deuteron reactions, Proton reactions, Alpha particle reactions, France.

The reactions 16O (d, alpha), (d,p), and 11B(d alpha), (d,p) were studied from 200 keV to 1 MeV. The interpretation of (d, alpha) reactions by the compound nucleus theory has shown the presence of 18F levels (7,94 MeV, 1 +; 8,09 MeV, 1 +) and of 13C level (19 Mev, 3/2 ± or 5/2-). The interpretation of 16O (d,p) and 11B (d,p) reactions at energies lower than 400 keV was given by a theory of Coulomb stripping. (Author)

RPI-328-20 Field 20G
CFSTI Prices: HC$3.00 MF$0.75

Rensselaer Polytechnic Inst., Troy, N. Y.
LINEAR ACCELERATOR PROJECT.
Progress report, Oct - Dec 64.
1964, 70p
Contract AT(30-3)-328

Unclassified report

Descriptors: (*Linear accelerators, Scientific research).

SC-RR-64-988 Field 20I
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
ASSEMBLY OF AN ARGON PLASMA IN MAGNETIC MIRROR GEOMETRY,
by John R. Banister, Everet H. Beckner, and Richard D. Jones. Sep 64, 23p
Contract AT-29-1-789

Unclassified report

Descriptors: (*Plasma medium, Configuration), (*Argon, Plasma medium).

SC-RR-64-1273 Field 20I
CFSTI Prices: HC$3.00 MF$0.75

Sandia Corp., Albuquerque, N. Mex.
COAXIAL RAIL ACCELERATION OF METAL-DERIVED PLASMAS (PHASE II),
by Ralph L. Schellenbaum. Oct 64, 69p
Contract AT29-1-789

Unclassified report

Descriptors: (*Plasma medium, Acceleration).

SC-TM-64-64A Field 20I
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
INTERACTION OF PLANE ELECTROMAGNETIC WAVES WITH A FULLY IONIZED PLASMA,
by A. J. Russo. Oct 64, 24p
Supersedes SC-TM-64-64
Contract AT(29-1)-789

Unclassified report

Descriptors:)*Plasma physics, Electromagnetic waves), (*Electromagnetic waves, Plasma physics).

SCL-TM-64-86 Field 20F
CFSTI Prices: HC$3.00 MF$0.75

Sandia Corp., Livermore, Calif.
FOUR BAROMETRIC PRESSURE ENVIRONMENTS FOR AN INDUSTRIAL FRINGE-COUNTING LASER INTERFEROMETER,
by C. A. Scott, C. J. De Carli, and R. N. Tone.
Nov 64, 54p
Contract AT(29-1)-789

Unclassified report

Descriptors: (*Inteferometers, Barometric pressure).

SCL-TM-64-110 Field 20K, 12A
CFSTI Prices: HC$2.00 MF$0.50

Sandia Corp., Livermore, Calif.
DYNAMIC ANALYSIS OF LUMPED MASS SYSTEMS,
by B. C. Ellis, and V. Gabrielson. Apr 65, 43p
Contract AT(20-1)-789

Unclassified report

Descriptors: (*Structurs, Loading(Mechanics)), (*Loading(Mechanics), Mathematical analysis).

SLAC-35 Field 20G, 9A
CFSTI Prices: HC$0.50 MF$0.50

Stanford Linear Accelerator Center, Stanford Univ., Calif.
FUNCTIONAL DESCRIPTION OF THE TRIGGER SYSTEM FOR THE STANFORD TWO-MILE ACCELERATOR.
Technical rept.,
by J. Faust. Jan 65, 21p
Contract AT(04-3)-400

Unclassified report

Descriptors: (*Particle accelerators, Trigger circuits), (*Trigger circuits, Particle accelerators).

TID-20344 Field 20K, 13H
CFSTI Prices: HC$2.00 MF$0.50

Rensselaer Polytechnic Inst., Troy, N. Y. Dept. of Materials Engineering.
A STUDY OF THE MATERIAL TRANSPORT MECHANISM IN SINTERING,
by F. V. Lenel. 1963, 35p CONF-640618-1
Contract AT(30-1)-1995
Unclassified report

Presented at the Symposium on Powder Metallurgy, Paris, 15-17 Jun 64.

Descriptors: (*Sintering, Transport properties), (*Transport properties, Sintering), (*Metals, Plasticity).

TID-21338 Field 20H
CFSTI Prices: HC$6.00 MF$1.50

Johns Hopkins Univ., Baltimore, Md.
NUCLEAR REACTIONS IN LIGHT NUCLEI AND MOSSBAUER STUDIES.
Oct 64, 255p
Contract AT(30-1)-2028
Unclassified report

Descriptors: (*Nuclear reactions, Mossbauer effect), (*Mossbauer effect, Nuclear reactions).

TID-21403 Field 20M
CFSTI Prices: HC$2.00 MF$0.50

Columbia Univ., New York. Engineering Research Labs.
FLOW INSTABILITY AND CRITICAL HEAT FLUX IN HEATED PARALLEL CHANNELS.
Topical rept.,
by J. E. Casterline and Donald M. Lee. 27 Oct 64, 44p
Contract AT(30-3)-187
Unclassified report

Descriptors: (*Pipes, Thermodynamics), (*Heat transfer, Fluid flow).

TID-21682 Field 20B
CFSTI Prices: HC$1.00 MF$0.50

Carnegie Inst. of Tech., Pittsburgh, Pa. Metals Research Lab.
A STUDY OF THE INTERACTION BETWEEN POINT DEFECTS AND DISLOCATION DAMPING EXPERIMENTS.
Annual progress rept.
1 Feb 65, 15p Unclassified report
Contract AT(30-1)-3001

Descriptors: (*Crystal lattice defects, Damping), (*Metallic crystals, Crystal lattice defects), Elasticity.

TID-21698 Field 20I
CFSTI Prices: HC$1.00 MF$0.50

Carnegie Inst. of Tech., Pittsburgh, Pa.
RESEARCH ON INSTABILITIES IN HIGHLY IONIZED LOW-PRESSURE METAL-VAPOR PLASMAS.
Progress rept. 1 Oct-31 Dec 64.
by M. F. Hoyaux, G. W. Penney, F. J. Young, and E. M. Williams. 1964, 5p EAC-4 Unclassified report
Contract AT(30-1)-3100

Descriptors: (*Plasma medium, Stability), Metals, Vapors.

UCRL-1011 Field 20H
CFSTI Prices: HC$4.00 MF$0.75

California. Univ., Berkeley. Radiation Lab.
NUCLEON-NUCLEON INTERACTION.
Doctoral thesis,
by Richard Stuart Christian. 1953, 101p
Contract W-7405-eng-48
Unclassified report

Descriptors: (*Nucleons, Scattering), (*Field theory, Nucleons).

UCRL-7437 Field 20M
CFSTI Prices: HC$5.00 MF$1.00

Lawrence Radiation Lab., Univ. of California, Livermore.
EQUATION OF STATE: A SURVEY OF THE THERMODYNAMIC PROPERTIES OF MATTER AT HIGH PRESSURES AND TEMPERATURES,
by Stephen G. Brush. 12 Jun 64, 192p
Contract W-7405-eng-48
Unclassified report

Descriptors: (*Thermal properties, Equations of state), (*Equations of state, Thermal properties).

UCRL-7539 (rev 1) Field 20B
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
THE CRYSTAL STRUCTURE OF HIGH BERYLLIA,
by Deane K. Smith, Carl F. Cline, and Stanley B. Austerman. 14 Jan 64, 18p
Contract W-7405-eng-48
Unclassified report

Descriptors: (*Beryllium compounds, Crystal structure), (*Crystal structure, Beryllium compounds), Oxides, Ceramic materials.

UCRL-7655 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
RESONANT CHARGE TRANSFER IN PROTONS ON HYDROGEN,
by M. N. Mittleman. 31 Jan 64, 14p
Contract W-7405-eng-48
Unclassified report

Descriptors: (*Proton scattering, Hydrogen), (*Resonance scattering, Protons).

UCRL-7677 (rev 1) Field 20G, 20I
CFSTI Prices: HC$3.00 MF$0.75

Lawrence Radiation Lab., Univ. of California, Livermore.
ION CYCLOTRON ELECTROSTATIC INSTABILITIES,
by Laurence S. Hall, Warren Heckrotte, and Terry Kammash. 11 Dec 64, 76p
Contract W-7405-eng-48
Unclassified report

Descriptors: (*Cyclotrons, Electrostatics), (*Plasma oscillations, Cyclotrons).

UCRL-7830 Field 20K, 20D, 1A
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
MECHANICAL MOTION IN VACUUM,
by Thomas H. Batzer. 15 Apr 64, 18p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Motion, Vacuum), (*Vacuum, Motion), (*Fluid mechanics, Vacuum), (*Fluid flow, Vacuum).

UCRL-11225 Field 20H
CFSTI Prices: HC$3.00 MF$0.75

Lawrence Radiation Lab., Univ. of California, Berkeley.
QUASI-PARTICLE INTERACTIONS IN EVEN-EVEN NUCLEI,
by Mannque Rho. 27 Jan 64, 66p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Even-even nuclei, Nuclear particles), (*Nuclear particles, Even-even nuclei).

UCRL-11535 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Berkeley.
OPTIMUM MULTIPLE SCATTERING,
by Douglas E. Greiner. Jun 64, 8p CONF-787-4
Contract W-7405-eng-48

Unclassified report

Presented at the International Conference on Nuclear Photography, (5th) Geneva, Sep 64.

Descriptors: (*Particles, Scattering), (*Nuclear particles, Optimization).

UCRL-11752 Field 20L
CFSTI Prices: HC$4.00 MF$1.00

Lawrence Radiation Lab., Univ. of California, Berkeley.
THE ELECTRICAL TRANSPORT AND MECHANICAL PROPERTIES OF TANTALUM - MOLYBDENUM ALLOY SINGLE CRYSTALS.
Doctoral thesis,
by Lenon I. Van Torne. Jan 65, 131p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Refractory metal alloys, Single crystals), (*Solid state physics, Refractory metal alloys).

UCRL-11849 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Berkeley.
REVIEW OF THE PI-NUCLEON EXPERIMENTAL SITUATION AND ITS PHASE SHIFT INTERPRETATION,
by V. Perez-Mendez and L. David Roper. Dec 64, 23p
Rept. no. CONF-669-4
Contract W-7405-eng-48

Unclassified report

Presented at the Conference on Particle Physics, Boulder, Colo., 28 Jun-3 Jul 64.

Descriptors: (*Pions, Nuclear scattering), (*Nuclear scattering, Phase shifters).

UCRL-11866 Field 20H
CFSTI Prices: HC$3.00 MF$0.75

Lawrence Radiation Lab., Univ. of California, Berkeley.
TWO STUDIES IN POTENTIAL SCATTERING THEORY. I. A GENERALIZATION OF LEVINSONS THEOREM TO THREE-BODY SYSTEMS. II. A VARIATIONAL METHOD AND EIGENFUNCTION EXPANSION FOR TWO-AND THREE-BODY SYSTEMS.
Doctoral thesis,
by Jon Alan Wright. 6 Jan 65, 76p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*N-body problem, Elementary particles), (*Elementary particles, N-body problem).

UCRL-11875 Field 20H
CFSTI Prices: HC$2.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Berkeley.
EFFECTS OF COLLECTIVE EXCITED STATES ON ALPHA PARTICLE BARRIER PENETRABILITY.
Master's thesis,
by Elizabeth A. Rauscher. 5 Jan 65, 50p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Lead, Multipolarity), (*Alpha particles, Penetration).

UCRL-11877 Field 20H
CFSTI Prices: HC$3.00 MF$0.75

Lawrence Radiation Lab., Univ. of California, Berkeley.
MEASUREMENT OF THE SPIN-CORRELATION PARAMETER C(NN) IN PROTON-PROTON S CATTERING AT 680 MEV.
Thesis,
by Helmut Ernst Dost. 5 Feb 65, 98p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Proton scattering, Hamiltonian), (*Correlation techniques), Proton scattering).

UCRL-11901 Field 20L
CFSTI Prices: HC$4.00 MF$0.75

Lawrence Radiation Lab., Univ. of California, Berkeley.
I. SIMILARITY PRINCIPLE AND ISOTOPE EFFECT IN SUPERCONDUCTING INDIUM. II. LOW-TEMPERATURE HEAT CAPACITY OF NIOBIUM.
Doctoral thesis,
by Nail Mehmet Senozan. Jan 65, 105p Unclassified report
Contract W-7405-eng-48

Descriptors: (*Indium, Superconductivity), (*Niobium, Cryogenics).

UCRL-11955 Field 20G
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Berkeley.
SURVEY OF INJECTION-SYSTEM DESIGN,
by W. A. S. Lamb. 16 Feb 65, 16p CONF-650306-18
Contract W-7405-eng-48 Unclassified report
Presented at the Particle Accelerator Conference, Washington, D. C.

Descriptors: (*Particle accelerator techniques, Injection).

UCRL-11983 Field 20G, 20H
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Berkeley.
NEUTRINO BEAMS FROM A HIGH INTENSITY 200 GEV PROTON SYNCHROTRON,
by V. Z. Peterson and D. Keefe. 12 Feb 65, 16p
CONF-650111-1
Contract W-7405-eng-48

Unclassified report

Presented at the Cern Informal Neutrino Conference, Geneva.

Descriptors: (*Synchotrons, Protons), (*Proton accelerators, Neutrinos).

UCRL-12158 Field 20J, 12A
CFSTI Prices: HC$2.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
THE GREENS FUNCTION FORMALISM FOR MULTI-COMPONENT SYSTEMS,
by J. C. Garrison. 13 Nov 64, 27p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Green's function, Quantum statistics), (*Quantum statistics, Green's function).

UCRL-12215-T Field 20G, 9B
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
COMPUTER PROGRAM FOR A HIGH-CURRENT ELECTRON ACCELERATOR,
by R. M. Bevensee. 1964, 11p CONF-650306-2
Contract W-7405-eng-48

Unclassified report

Presented at the Particle Accelerator Conference, Washington, D. C.

Descriptors: (*Electron accelerators, Programming-(Computers)), (*Programming(Computers), Electron accelerators).

UCRL-12343 Field 20C, 9B
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
A FORTRAN PROGRAM FOR THE NUMERICAL SOLUTION OF THE SCHRODINGER WAVE EQUATION,
by George Wilcox. 1 Feb 65, 11p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Programming(Computers), Field theory), (*Field theory, Programming(Computers)).

UCRL-12356 Field 20D, 20M
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
ON MOVING POINT SINGULARITIES,
by Maurice Neuman. 4 Mar 65, 9p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Fluid flow, Thermal conductivity), (*Partial differential equations, Fluid flow).

UCRL-12412 Field 20A, 20D, 20K
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
PROPAGATION OF DISTURBANCES,
by J. Hardy. 22 Feb 65, 16p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Hydrodynamics, Shock waves), (*Mechanical waves, Propagation).

UR-875-28 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Rochester Univ., N. Y. Dept. of Physics and Astronomy.
BOUNDARY CONDITION MODEL. II. ANTIHYPERON-NUCLEON SCATTERING,
by Martin S. Spergel. 27 Mar 64, 25p
Contract AT(30-1)-875

Unclassified report

Descriptors: (*Hyperons, Elastic scattering), (*Nucleons, Elastic scattering), Antiparticles, Nuclear models.

UR-875-30 Field 20H
CFSTI Prices: HC$2.00 MF$0.50

Rochester Univ., N. Y. Dept. of Physics and Astronomy.
DECAY MODE K TO 2 PIONS + GAMMA-RAY,
by Stephan V. Pepper and Yoshiaki Ueda. 6 Apr 64, 35p
Contract AT(30-1)-875

Unclassified report

Descriptors: (*Radioactive decay, Pions), (*K mesons, Pions), Nuclear models.

21. Propulsion and Fuels

AD-452 236 Field 21I, 1A
CFSTI Price: HC$2.00

Aerospace Corp., El Segundo, Calid. Lab. Operations.
NONEQUILIBRIUM ROCKET NOZZLE RECOMBINATION LOSSES,
Technical documentary rept.,
by E. A. Cook and L. Schieler. 15 Oct 64, 45p
Rept. no. TDR-469(9210-02)-1
Contract AF04 695 469
SSD TDR-64-183

Unclassified report

Descriptors: (*Nozzle gas flow, Recombination reactions), Analysis, Nonequilibrium flow, Liquid rocket propellants, Frozen equilibrium flow, Hydrogen, Oxygen, Nitrogen compounds, Combustion products, Oxides, Chlorine, Fluorine.

Nonequilibrium performance losses are interpreted in terms of radical concentrations and extent of recombination throughout the expansion process. A brief description of the Bray method for determining the location of departure from equilibrium flow in a rocket nozzle is given. The analysis is applied to N2O4-aerozine, H2-O2 and H2-F2 propellants and a hypothetical H2-C12 system to obtain the point of effective freezing as a function of area ratio. The kinetic rates for the reactions occurring in the combustion process are discussed, and the values for the rates are included. (Author)

Patent 3,196,735 Field 21I, 13H

METHOD OF CASTING A FOAM-CORED ROCKET PROPELLANT GRAIN.
Patent assigned to Navy,
by John E. Baldwin. 27 Jul 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Solid rocket propellants, Rocket propellant grains), (*Rocket propellant grains, Casting), (*Casting, Rocket propellant grains), Expanded plastics, Rocket motors, Styrene plastics, Mandrels, Patents.

A foam-cored rocket propellant grain is cast in situ in a rocket motor. The inside of the motor is coated with an inhibitor, a preformed organic foam core is disposed centrally within the motor, a propellant grain mixture is cast around the core and the grain is cured in place.

Patent 3,197,348 Field 21I

THIXOTROPIC PROPELLANT.
Patent assigned to Navy,
by Sol Skolnik and Emanuel D. Margolin. 27 Jul 65
Unclassified patent

Available from Commissioner of Patents,
Washington, D.C., 20231, $0.25

Descriptors: (*Thixotropic rocket propellants, Preparation), Gels, Solid rocket oxidizers, Catalysts, Solid rocket fuels, Particles, Silicon compounds, Dioxides, Carbon, Powder metals, Liquid rocket oxidizers, Nitroglycerin, Ammonium compounds, Nitrates, Patents.

The propellants may be used for the propulsion of missiles, rockets, torpedoes or any vehicle which cannot use air as a source of oxidizer. The propellant includes a liquid fuel component, an oxidizer and a finely divided particulate material to make the composition thixotropic. The particulate material may be silica, carbon or finely divided metals. Specifically claimed is a propellant in which the fuel component is nitroglycerin, the solid component is ammonium nitrate, and the particulate material is silica.

PB-168 323 Field 21H, 11B
CFSTI Prices: HC$1.00 MF$0.50

High Temperature Materials, Inc., Boston, Mass.
PYROLYTIC CARBIDE DEVELOPMENT PROGRAM.
Monthly progress rept. no. 8, 1-30 Nov 60.
30 Nov 60, 13p
Contract NOw60 0292FBM
AD 248 048
Unclassified report

Available copy will not permit fully legible reproduction.
See also PB-163 938.

Descriptors: (*Rocket motor nozzles, Carbides), (*Carbides, Rocket motor nozzles), (*Refractory coatings, Rocket motor nozzles), Tantalum compounds, Niobium compounds, Structural properties, Chlorides, Microstructure, Refractory materials.

Tantalum carbide of excellent quality was produced as coatings on flat specimens and as coatings on environmental test samples. The coatings analyzed were composed of a single TaC phase without the presence of either tantalum metal or free carbon. A highly preferred orinetation was found to exist in TaC coatings where the 100 basal plane is parallel to the deposition surface. The structure of pyrolytic TaC was also found to contain twin bands which are thought to be thermal twins which form on cooling from the deposition temperature. The processing investigation for pyrolytic niobium carbide was initiated, however, the material produced has not yet been evaluated. (Author)

PB-168 325 Field 21H, 11B
CFSTI Prices: HC$1.00 MF$0.50

High Temperature Materials, Inc., Boston, Mass.
PYROLYTIC CARBIDE DEVELOPMENT PROGRAM.
Monthly progress rept. no. 4, 1-31 Jul 60.
31 Jul 60, 10p
Contract NOw60 0292FBM
AD 241 459
Unclassified report

See also PB-163 937.

Descriptors: (*Rocket motor nozzles, Carbides), (*Carbides, Rocket motor nozzles), (*Refractory coatings, Rocket motor nozzles), Silicon compounds, Preparation, Refractory materials, Methane, Chlorides.

A total of thirteen experiments were conducted in the investigation of SiC formation. The reaction temperature using SiCl4 and CH4 was varied over the range from 1300C to 1900C; the reaction pressure was also varied from 10 to 600 mm. The SiCl4 flow rates were between 0.4 and 2 g/min, and the SiCl4 to CH4 weight ratio from 4 to 20. The deposition of carbon, found in the SiC matrix, was greatly reduced with ratios greater than the stoichiometric value of 10.6. However, with any ratio carbon deposition was only avoided when a significant decomposition rate of the SiCl4 was obtained. At the lower and higher temperatures, extremely low deposition rates were obtained probably because of the low SiCl4 decomposition rates at low temperatures or under increased pressure at high temperatures. Since SiC is decomposed under reduced pressure the system pressure needed to be increased to operate at the higher temperatures. The optimum operating conditions was found to be at 1500C under a pressure of 400 mm. The efficiency of the reaction based on 100% utilization of methane was found to lie between 1 and 54%. However, the higher values obtained were not realistic because the structures contained both SiC and pyrolytic carbon. It was estimated that the highest efficiency obtained based only on the SiC formed is approximately 20%. An X-ray analysis has shown that the SiC deposits were entirely beta SiC and that there was little or no anisotropy in the crystal orientation.

22. Space Technology

SC-TM-64-1288 Field 22B
CFSTI Prices: HC$2.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
WIND TUNNEL FORCE AND DYNAMIC TESTS OF THE RFD-2 RE-ENTRY VEHICLE AT MACH 5.4 AND 7.7 (PROGRAMS VI - 13 AND 14),
by J. K. Cole and R. N. Everett. Oct 64, 37p
Contract AT(29-1)-789
Unclassified report

Descriptors: (*Reentry vehicles, Tests).

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